

A revision of the genus *Zidalus* MULSANT et REY, 1856* (*Coleoptera: Tenebrionidae: Platynotini*)

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ABSTRACT. *Zidalus* MULSANT et REY is an African genus of *Platynotini*; it includes 13 species; of them *Z. burakowskii* (Guinea) and *Z. mahaimi* (Liberia) are new to the science. The following new synonymies are proposed: *Zidalus* MULSANT et REY, 1853 (= *Zodinus* MULSANT et REY, 1853; = *Apterozidalus* ARDOIN, 1965) and *Z. servus* (MULSANT et REY, 1853) (= *Opatriinus setuliger* MUELLER, 1887). *Apterozidalus royi* (ARDOIN, 1965) has been included in the genus *Zidalus* MULS. et REY. A modern key for species identification is provided.

Key words: entomology, taxonomy, revision, *Coleoptera*, *Tenebrionidae*, *Zidalus*, Afrotropical region.

INTRODUCTION

In their 1853 revision MULSANT and REY distinguished the following subgenera in the genus *Opatriinus* DEJEAN: *Opatriinus* s. str., *Zidalus* MULS. et REY and *Zodinus* MULS. et REY. They included both African and American species.

In 1956 KOCH, describing the African species of the *Platynotini*, maintained the division of the genus *Opatriinus* into three subgenera and gave them a new interpretation (*Zidalus* and *Zodinus* including only the African species).

In my revision of the genus *Opatriinus* DEJEAN (IWAN 1995), an analysis of all the available characters based on detailed comparative studies did not reveal any synapomorphy which would justify the currently accepted interpretation of the genus.

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Opatrinus DEJEAN includes only New World species, forming a monophyletic group (synapomorphies: widely interrupted margin in the middle of pronotum base and large, round, funnel-shaped holes forming lines on the elytra so that the elevation of the intervals is not uniform).

The subgenus *Zidalus* MULSANT et REY, elevated to the generic rank, includes African species of the genus *Opatrinus* DEJEAN and *Apterozidalus* ARDOIN, 1965 (synapomorphy: distinctive elevation of the elytral pseudopleura at the apex).

ACKNOWLEDGEMENTS AND DEPOSITORIES OF THE MATERIAL STUDIED

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ANSP Department of Entomology, Academy of Natural Sciences, Philadelphia, PA USA (D. AZUMA);
CISC California Insect Survey, Division of Entomology, University of California, Berkeley, CA USA (J. T. DOYEN);
DEI Institut für Pflanzenschutzforschung, Eberswalde, Germany (L. ZERCHE);
HBC Hans J. BREMER Collection, Heidelberg, Germany;
IRSNB Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgium (L. BAERT);
MIZPAN Muzeum i Instytut Zoologii, Polska Akademia Nauk, Warszawa, Poland;
MNHN Muséum National d'Histoire Naturelle, Paris, France (C. GIRARD);
MRAC Musée Royal de l'Afrique Centrale, Tervuren, Belgium (H. ANDRÉ);
NHMB Naturhistorisches Museum, Basel, Switzerland (M. BRANCUZZI);
NMW Naturhistorisches Museum, Wien, Austria (H. SCHÖNMANN);
OSUC Ohio State University Collection of Insects and Spiders, Columbus, OH USA (Ch. A. TRIPLEHORN);
RGC Roland GRIMM Collection, Tübingen, Germany;
RLAC Rolf L. AALBU Collection, Columbus, OH USA;
TM Transvaal Museum, Pretoria, South Africa (S. ENDRÓDY-YOUNGA);
TMB Termeszettudományi Muzeum, Budapest, Hungary (O. MERKL);
ZMAN Instituut voor Taxonomische Zoölogie, Zoölogisch Museum, Universiteit van Amsterdam, Amsterdam, The Netherlands (B. BRUGGE);
ZMB Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (F. HIEKE);
ZMH Zoological Museum, Helsinki, Finland (H. SILFVERBERG);
ZMK Zoologisk Museum, Kopenhagen, Denmark (O. MARTIN).

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Abbreviations

pl/pb - pronotum length/breadth ratio;
el/eb - elytra length/breadth ratio;
el/pl - length ratio elytra/pronotum;
eb/pb - breadth ratio elytra/pronotum;
ml/avl - length ratio metasternum/first abdominal ventrite;
mc - length ratio metasternum between insertions of mid and hind coxae/hind coxae insertion;
ft - segments of fore tarsi;
mt - segments of mid tarsi;
ht - segments of hind tarsi.

SYSTEMATICS

Together with *Opatriinus* and African *Quadrideres* and *Ectateus*, *Zidalus* forms a closely related group characterized by a very strongly reduced first pair of coxites and a spermatheca in shape of a bundle of multiply dichotomously branched ducts of a small diameter. *Zidalus* differs from those genera in an apomorphy consisting in convex apical part of the elytral pseudopleura. The character is shared by a group of anchophthalmoid *Platynotina*, but in that group the first pair of coxites is strongly convex, and the spermatheca is formed of ducts of a relatively large diameter.

CLADISTIC ANALYSIS OF THE GENUS *ZIDALUS* MULS. ET REY.

Cladistic analysis was carried out on 13 species of the genus *Zidalus* MULS. et REY.

After a preliminary study 14 characters were selected; their character states were used to construct the data matrix (table 1).

The characters were polarized, based on a study of out-groups (*Opatriinus* DEJ. and African genera of the subtribe *Platynotini*).

As a result of the analysis with the use of Henning86 (version 1.5) programme (FARRIS 1988), one cladogram was obtained, 15 steps long, of consistency index (CI) of 0.93 and retention index (RI) of 0.95. Two versions of this cladogram represent hypotheses on the relationships between the species and species groups within the genus *Zidalus* MULS. et REY.

The analysis of the genus *Zidalus* M&R indicates that the hitherto accepted division into two subgenera is unjustified. The prominent eyes (subgenus *Zodinus* M&R sensu KOCH, 1956) in 4 species (*servus* group) are an apomorphous character, however, non-prominent eyes (subgenus *Zidalus* M&R sensu KOCH, 1956) are a symplesiomorphy of the remaining species. No synapomorphy has been found for those. A phylogeny has been proposed for the genus *Zidalus* (fig. 1). The difference between the two cladograms pertains to the position of *Z. niloticus*. In the first variant it belongs to a clade with the *corvinus* group (lateral margins of the mid part

of mentum do not reach mentum sides - the character was reversed in *Z. corvinus*; wrinkled elytral intervals). In the second variant *Z. niloticus* is separate, and *Z. corvinus* and *Z. erythraeus* form a distinct group (synapomorphy: posterior pronotal angles straight). *Z. niloticus* shares many characters (plesiomorphies) with members of the genus *Opatriinus* DEJ. (8 elytral row free; arrangement of bare gutters on the underside of tarsi).

The list of characters and their states (0-plesiomorphies, 1-apomorphies)

1. Tempora - narrower than eyes (0); wider than eyes (1).
2. Eyes: not or only slightly protruding (3-4 facets between tempus and genae (0); protruding (5 facets) (1).
3. Lateral margins of mid part of mentum: not reaching mentum sides (0); reaching mentum sides (1).
4. Antennae: simple (0); modified (1).
5. Pronotal posterior angles: sharp (0); straight (1).
6. Disc at the base of pronotum: evenly convex (0), with two longitudinal concavities (1).
7. Bordering of prosternal process: entire (0); interrupted at tip (1).
8. Connection of elytral rows: 7-8 (0); 8-free (1).
9. Punctuation in rows: coarse (30-41 punctures in IV row) (0); fine (43-66 punctures in IV row) (1).
10. Intervals: punctate (0); wrinkled (1).
11. Fore femora in males: simple (0); modified (1).
12. Hind tibiae in males: simple (0); arcuately bent (1).
13. Gutters on the underside of female tarsi: mid - 1-4 terminal segments, hind - 1-3 segment (0); mid - 1 segment, hind - 1 and 2 segment (1).
14. Spermatheca: simple (0); with two sclerotized plates (1).

Zidalus MULSANT et REY, 1853 status novo

Zidalus MULSANT et REY, 1853a: 296; 1853b: 71; GEMMINGER and HAROLD 1870: 1914; GEBIEN 1910: 276; 1938: 296; KOCH 1956: 93. Type species by monotypy (MULSANT and REY 1853a, 1853b): *Opatriinus corvinus* MULSANT et REY, 1853.

Zodinus MULSANT et REY, 1853a: 315; 1853b: 90; GEMMINGER and HAROLD 1870: 1914; GEBIEN 1910: 276; 1938: 296; KOCH 1956: 93. Type species: *Opatriinus servus* MULSANT et REY, 1853.

Apterozidalus ARDOIN, 1965b: 1315 *syn. nov.* Type species: *Apterozidalus royi* ARDOIN, 1965.

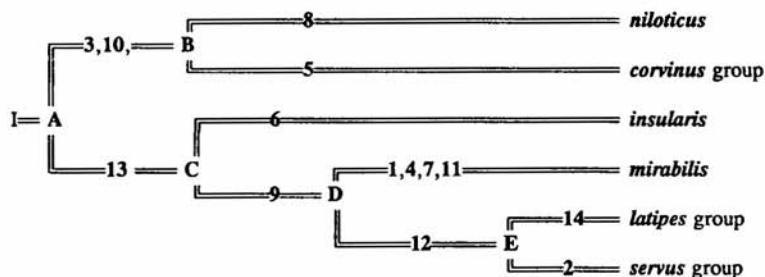
DIAGNOSIS

Species of the genus *Zidalus* are characterized by an entire bordering of the pronotum base (figs 16-21) and fine punctuation of elytral rows, situated in sharply incised gutters, thanks to which the intervals are evenly convex. The strong concavity

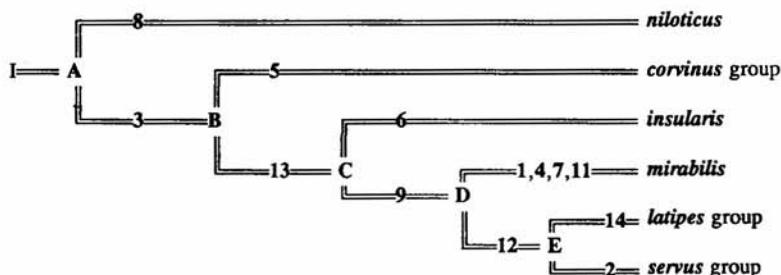
Table 1. Matrix of character states for all members of *Zidalus*

species	character													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
<i>attenuatus</i>	0	1	1	0	0	0	0	1	0	0	1	1	0	
<i>corvinus</i>	0	0	1	0	1	0	0	0	1	0	0	0	0	
<i>costulatus</i>	0	1	1	0	0	0	0	0	1	0	0	1	1	0
<i>erythraeus</i>	0	0	0	0	1	0	0	0	0	1	0	0	0	
<i>exalatus</i>	0	0	1	0	0	0	0	0	1	0	0	1	1	1
<i>burakowskii</i>	0	0	1	0	0	0	0	0	1	0	0	1	1	1
<i>insularis</i>	0	0	1	0	0	1	0	0	0	0	0	0	1	0
<i>latipes</i>	0	0	1	0	0	0	0	0	1	0	0	1	1	1
<i>mahaimi</i>	0	1	1	0	0	0	0	0	1	0	0	1	1	0
<i>mirabilis</i>	1	0	1	1	0	0	1	0	1	0	1	0	1	0
<i>niloticus</i>	0	0	0	0	0	0	0	1	0	1	0	0	0	
<i>royi</i>	0	0	1	0	0	0	0	0	1	0	0	1	1	1
<i>servus</i>	0	1	1	0	0	0	0	0	1	0	0	1	1	0

Cladogram I.



Cladogram II.



1. Cladograms

of the terminal part of elytral pseudopleura places them close to the group of anchophthalmoid *Platynotina*. Like in *Opatrinus*, most members of the genus have fully developed wings (partly reduced in *Z. insularis*, completely so in *Z. exalatus* and *Z. royi*); the wing venation in members of the genera *Zidalus* and *Opatrinus* is almost identical.

The first pair of coxites is strongly reduced, and the spermatheca has a shape of a bundle of multiply dichotomously branched ducts of a small diameter.

DESCRIPTION

Length 8.2-17.0 mm. Body elongate, moderately convex, dark brown to black, shiny or with a mat, silky sheen, delicately hairy, legs and antennae usually lighter coloured. Eyes not protruding or distinctly protruding outside the lateral outline of head, mentum divided into three parts (figs 64-68), the last segment of maxillary palps in males wider than in females. Pronotum evenly convex, anterior angles protruding, pronotum base doubly sinuately emarginate, sides and base distinctly bordered, anterior margin with the bordering widely interrupted in middle. Elytra wider than pronotum, strongly convex and slightly widened posterad, terminally rounded (in females more convex and widened posterad). Elytral rows formed of fine punctures, arranged in sharply incised grooves; intervals evenly concave. In the posterior part of elytra rows connected in the following way: 1 free, 2-9, 3-6, 4-5, 7-8 (only in *Z. niloticus* 1-9, 2-7, 3-6, 4-5, 8 free). Elytral epipleura gradually narrowed posterad, slightly wrinkled and delicately punctured; in its posterior part strongly convex and situated dorsally. Anterior prosternum margin distinctly bordered. Bordering of the anterior margin of the first abdominal ventrite interrupted in the middle, between insertions of hind coxae. Fore tibiae in males with a concavity on the outer side (in *Z. attenuatus* no concavities), mid tibiae with a denticle, hind tibiae arcuately bent. Fore tarsi in males strongly widened; their underside covered with thick, short, yellow hairs, with a bare, shiny gutter in the middle. Structure of copulatory organs in both sexes similar to that found in members of *Opatrinus*.

DISTRIBUTION

The distribution range of the genus comprises the entire tropical Africa, Madagascar and adjacent islands; in the north it reaches Alexandria along the Nile River valley (the only species, *Z. corvinus*, often regarded as a Palaearctic species, though its main distribution area is the northern part of tropical Africa); in the south it reaches the eastern part of Cape Province.

REMARKS

I have not seen specimens described by GRIDELLI (1947) as subspecies *Z. latipes* ssp. *tanaensis*, *Z. insularis* ssp. *somalicus*, *Z. setuliger* ssp. *camerunensis*, *Z. attenuatus* ssp. *bottegoi*, and *Z. niloticus* ssp. *angulicollis* (FAIRMAIRE 1887) and *Z. niloticus* ssp. *zolotarevskyi* (ESPAÑOL 1948), but the material examined by me justifies, especially in view of KOCH's (1956) remarks, treating them as ungrounded.

Maintaining these subspecies is of slight importance for the systematics and is debatable because of the lack of distinct characters that would distinguish them subspecies from the nominotype subspecies. The descriptions should only be regarded as reflecting the geographic variation of the typical forms, e.g. *corvinus* var. *pinheyi* and *niloticus* var. *edentatus* (Koch 1956).

KEY FOR SPECIES DETERMINATION

1. Rows 7 and 8 connected in the posterior part of elytra 2.
- , Row 8 free *niloticus*
2. Posterior angles of pronotum straight; bare gutters on the underside of tarsi in males on 1-3 ht, in females on 1-4 mt and 1-3 ht 3.
- , Posterior angles of pronotum sharp; bare gutters on the underside of tarsi in males on 1-2 ht, in females on 1 mt and 1-2 ht 4.
3. Last abdominal ventrite not bordered; male mid tibiae with no denticle; lateral margins of mid part of mentum reach sides of mentum (fig. 68); bare gutters on the underside of female tarsi present on 1 ft *corvinus*
- , Last abdominal ventrite bordered; mid tibiae in males bear a denticle; lateral margins of mid part of mentum do not reach mentum sides (fig. 67); bare gutters on the underside of female tarsi present on 1-4 ft *erythraeus*
4. Punctuation in rows coarse (up to 30 punctures in row IV) (fig. 71); pronotum at base evenly convex 5.
- , Punctuation in rows fine (43-66 punctures in row IV) (fig. 79); pronotum with two longitudinal concavities at base (fig. 21) *insularis*
5. Tempora not protruding; prosternal process completely bordered; male antennae and fore femora simple; male hind tibiae arcuately bent 6.
- , Tempora strongly protruding (fig. 6); prosternal process not bordered on its tip (fig. 55); male antennae and fore femora modified; male hind tibiae straight *mirabilis*
6. Eyes not or only slightly protruding (3-4 facets in the narrowest part between the genae and tempora, figs 3-7); spermatheca with 2 sclerites 7.
- , Eyes protruding (5 facets in the narrowest part between the genae and tempora, figs. 12-15); spermatheca simple 10.
7. Posterior angles of pronotum do not reach pronotum base (figs 16-17); sides of prosternum wrinkled (fig. 70); denticle on male mid tarsus large 8.
- , Posterior angles of pronotum protrude beyond the base (fig. 19); prosternum sides punctured (fig. 69); denticle on male mid tibia small (fig. 63) *exalatus*
8. Denticle on male mid tibia on the apex (figs 44, 50) 9.
- , Denticle on male mid tibia before the apex (figs 47, 53) *burakowskii*
9. Wings well developed, metasternum well developed (ml/avl more than 0.89, mc above 1.06) *latipes*
- , Wings reduced, metasternum shortened (ml/avl below 0.82, mc below 0.91) *royi*

10. Male fore tibia not widened (figs 22-23, 29-30); male mid tibia with a ridge on the inner side, and with a small denticle (figs 45-46, 51-52) 11.
- , Male fore tibia widened (figs 27-28, 34-35); male mid tibia with no ridge on the inner side, and a large denticle (figs 42-43, 48-49) 12.
11. Mesosternum poorly punctured (fig. 40); on male mid femur a spine (fig. 74)
..... *attenuatus*
- , Mesosternum strongly punctured (fig. 41); male mid femur with no spine
..... *servus*
12. Body strongly hairy (fig. 57); denticle on male mid tibia before the apex (figs 43, 49) *costulatus*
- , Body sparsely hairy (fig. 56); denticle on male mid tibia on the apex (figs 42, 48)
..... *mahaimi*

***Zidalus latipes* (SAHLBERG, 1823) comb. nov.**

Opatriinus latipes SAHLBERG, 1823: 13; GEMMINGER and HAROLD 1870: 1915; GEBIEN 1910: 277; 1938: 296; GRIDELLI 1947: 46; 1954: 126; KOCH 1956: 105; ARDOIN 1963: 222; 1965a: 964; 1969a: 124; 1969b: 143; 1972a: 880; 1972b: 8; KASZAB 1963: 344; GIRARD 1975: 372.

Opatriinus Latipes SCHÖNHERR (sic!): DEJEAN 1836: 213.

Opatriinus ovalis MULSANT et REY, 1853a: 315; 1853b: 90; GEMMINGER and HAROLD 1870: 1915; FAIRMAIRE 1891: 88; [GEBIEN 1907: 404;] 1910: 277; 1921: 21; syn. by GEBIEN 1938: 296.

Opatriinus atratus QUEDENFELDT, 1885: 8; GEBIEN 1910: 276; 1938: 296; syn. by GRIDELLI 1947: 46.

Opatriinus annamita FAIRMAIRE, 1888: 356; syn. by ARDOIN 1969a: 124.

Opatriinus opacus GEBIEN, 1904: 4; GEBIEN 1910: 277; 1921: 21; syn. by GEBIEN 1938: 296; KULZER 1963: 410.

Opatriinus latipes tanaensis GRIDELLI, 1947: 47; KOCH 1956: 105.

Terra typica: Sierra Leone.

DIAGNOSE

The species, together with *burakowskii*, *royi* and *elatus*, forms the group *latipes*, characterized by a similar shape of mentum (fig. 66) and the presence of 2 longitudinal sclerotized plates in the primary spermatheca.

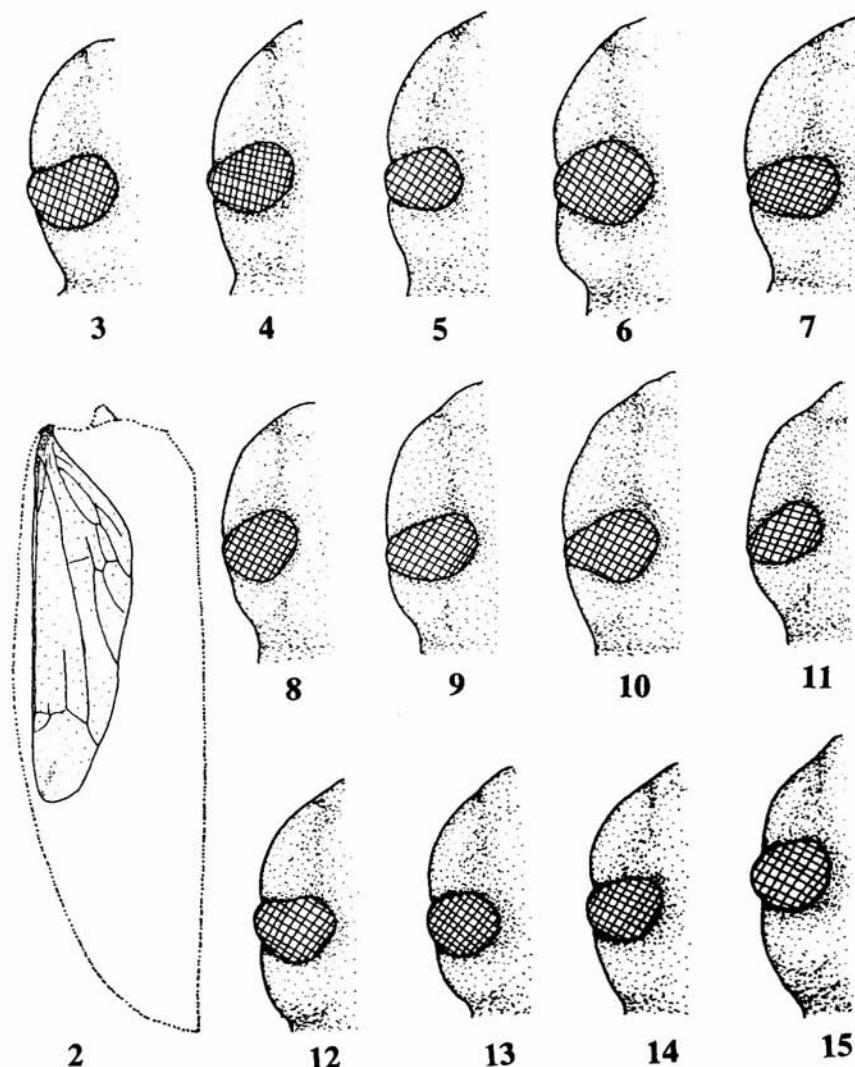
Z. latipes has well developed wings, like *burakowskii* (reduced in *exalatus* and *royi*), differs from *burakowskii* in the structure of male mid tibiae.

DESCRIPTION

Body length 11.3-17.0, $pl/pb = 0.60-0.63$, $el/eb = 1.45-1.57$, $el/pl = 2.72-2.96$, $eb/pb = 1.13-1.20$, $ml/avl = 0.90-0.97$, $mc = 1.06-1.25$, shiny, bare gutters on the underside of tarsi in males on 1-2 ht (figs 93-98), in females on 1 mt and 1-2 ht (figs 81-86). Aedeagus as in figs 90-92.

MATERIAL EXAMINED

Angola: Dundo, II. 1940, A.B. MACHADO, (TM) 4 m, 4 f; Mocamedes, 19.V.1949, Dr. E. DARTEVELLE, (MRAC) 1 f; Saurimo, Nov. 1949, Padre EDUARDO, (TM) 1 f,



2. *Zidalus insularis*, wing; 3-15. Head: 3 - *Z. latipes*, 4 - *Z. burakowskii*, 5 - *Z. royi*, 6 - *Z. mirabilis*, 7 - *Z. exalatus*, 8 - *Z. corvinus*, 9 - *Z. erythraeus*, 10 - *Z. insularis*, 11 - *Z. niloticus*, 12 - *Z. costulatus*, 13 - *Z. attenuatus*, 14 - *Z. mahaimi*, 15 - *Z. servus*

Botswana: Andana Bagani, Okavango, SWA, XI.1951, R.G. STREY, (TM) 1 f;
 Burundi: Kitega, VII. VIII. 1934, LEFÈVRE, (MRAC) 1 m, 1 f; Cameroon: V.72,
 L. COLIN (ZMB) 1 f, 1 m; (ZMH) 1 m, 1 f, (ZMK) 2 m; L. CONRADT, 1898 - 1899,
 (MNHN) 2 f; CONRADT, Coll. KRAATZ, (NMW) 1 m, 2 f; Bamenda, X.13.1973,
 (RLAC), 1 m; Bamum, 6.1912, (NMW) 5 f, 2 m; Bipindi, G. ZENKER S, (ZMB) 1 f;
 Bitye Ja River, 3000 feet, (MNHN) 1 m; Bungana, v. RAMSAY S.G. 1913 (ZMB) 1 m;
 Bumbu, 16.4.12, WAIBEL I.G., (ZMB) 1 m; Dodo 9-12.III.09, RIGGENBACH S.G.,
 (ZMB) 1 f; Ebodowa 700 m, 15-25.IV.1912. v. KOTKIRCH S.G., (ZMB) 2 m, 1 f;
 Fanggebiet, (ZMB) 1 m; Iangandi (ZMB) 1 m; Iassu, 28.II.14, MILDRAET S.G.
 (ZMB) 1 f, 1 m; Japoma Dr. SCHÄFER S.G., (ZMB) 1 f; Jaunde-Stat. 800 m, ZENKER S,
 (ZMB) 1 f; Joh. Albertschhöhe (Albrechtshöhe) CONRADT S.G., (ZMB) 2 m, 1 f;
 Joko, (ZMAN) 1 m, 1 f; Joko, (ZMB) 1 f; Joko, 10.V.12, WAIBEL I.G., (ZMB) 1 m,
 1 f; Joko, VII.1912, E. HINTZ, (ZMB) 5 m, 4 f; Moliwe G. Victoria, 1-8.12.07, (ZMB)
 1 m, 7.3-1.4.09, (ZMB) 1 f; Mukonje, (TM) 4 m, 5 f, (ZMB) 1 f; Mundame, (Kam.)
 R. ROHDE, Coll. KRAATZ, (NMW) 2 m, 7 f; Nanga Eboko, III-IV.1959, leg. LENCZY,
 (TMB) 3 m, 15 f; Neu-Kamerun, TESSMANN S.G., (ZMB) 1 m, 1 f; Nssanakang
 A. DIEHL S.G., (ZMB) 1 f; N'Kongsamba, Fr. Cameroons, VII.57, ex ARDOIN, (TM)
 2 m, 4 f; Tibati-Joko, 7-16.VII.01, GLAUNING S., (ZMB) 1 f; Tinaüd Kam, L. COLIN
 (ZMB) 1 f; Tukan, L.Kolin, IV.12, (ZMB) 1 f; Weg.v.Gasa n. Batüri NAUMANN S.G.,
 (ZMB) 1 f; Wujang, L.Kolin, VI.1911, (ZMB) 1 f; Wütschong, 23.4.12, WOUBEL
 S.G. (ZMB) 1 f; Yaoundé, 1980, (RLAC) 7 m, 11 f; Yaoundé, J. VADOK 1931
 (MNHN) 1 m, 3 f; Yaoundé, D. NOEL 1922, (MNHN) 1 m;

Central African Republic: Rep. Centrafric., La Maboke 4.IX.1970 L. MATILE
 rec., (MNHN) 1 f, 12.IX.1970, (MNHN) 1 m; V - 1964, J. CARAYON, (MNHN) 4 m,
 2 f;

Dahomey, Env. de Porto-Novo, WATERLOT 1911, (MNHN) 1 m, 1 f;

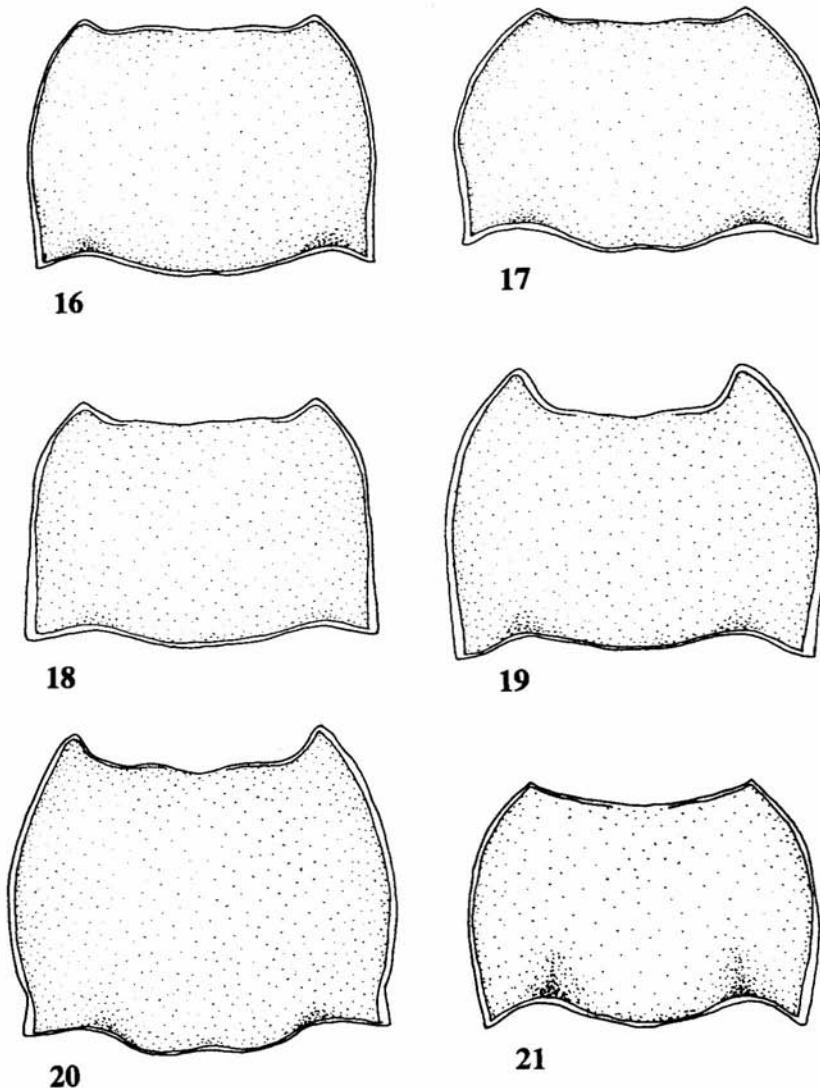
Ethiopia: Abyssinie, Mission De Bonchamps Ch. MICHEL & M. POTTER 1899,
 (MNHN) 1 f, 1 m;

Fernando-Poo: W. Afrika, J. Fernando-Póo, 28.IV-10.VIII.00, L. CONRADT
 S.V., (ZMB) 1 f;

Gabon: Bas-Ogooué, Entre Lambaréne Et La Mer, E. HAUG 1901, Museum
 Paris, (MNHN) 3 m, 1 f; Ogooué, Lambaréne, R. ELLENBERGER 1913, (MNHN) 1 f;
 Tholon, 1883, (MNHN) 1 f;

Ghana: Ashanti, region Kwadaso, 320 m, N 6°42' - W 1°29', Dr. S. ENDRÓDY-
 YOUNGA, Nr. 345 black light, 5.V.1969, 1 f; Northern region Tamale, 184 km,
 N 8°25' - W 0°53', Dr S. ENDRÓDY-YOUNGA, Nr 419 light trap, 11.III.1970, (TM) 1 f;
 Nyankpala, 15 km W von Tamale leg. Dr. S. ENDRÓDY No 26 Lichtfalle,
 21-31.V.1970, (TM) 1 f; Volta, reg. Abuadi, N G. 00° - 80°, S. ENDRÓDY-YOUNGA,
 soil trap, 1969/72 3 m, 1 f;

Guinea: Bas Chari, Mom, Chaom, Kouka, Mission Chari-Tchad, Dr. J. DECORSE
 1904 (MNHN) 1 m; Camayenne, A G Kil. de Konakry, L. DUPORT 1909, (MNHN) 1
 m; Chari-Tchad, Fort Sibut, Collection LE MOULT, Coll. J. CHATANAY 1914 (MNHN)
 7 m, 9 f; Dar-Banda Mérid, Krébédjé, (Fort Sibut), (MNHN) 9 f; Dixine foulah Prés



16-21. Pronotum: 16 - *Zidalus burakowskii*, 17 - *Z. latipes*, 18 - *Z. mahaimi*, 19 - *Z. exalatus*, 20 - *Z. corvinus*,
21 - *Z. insularis*

Konakry, P. CHANABAUT, Novembre, (MNHN) 1 f; Farmoréa, DÉCHET 1907, (MNHN) 1 m; Fort Archambault, Bakaré ou Boungoul, (MNHN) 3 m, 4 f; Fort Archambault, Bahr El Azreg, (MNHN) 3 m, 1 f; Fort Archambault, Pays Sara, Goundi, (MNHN) 1 f; Fort Lamy, (MNHN) 1 m, 2 f; Haut Oubangui, Bessou (Mission), Amont de Fort de Possel, (MNHN) 5 m, 8 f; Guinea, (NHMB) 1 m, 1 f; Guinée française, Bassin du Moyen-Niger, Sanscudidy, R. CHUDEAU 1909, Octobre, (MNHN) 1 f; Himba, M. LAMOTTA II.VI.42, Keoulenta, (MNHN) 1 m; Kissidougou et. de Beyla, Hinterland, Mission PAULY Dr. PAULY 1901, (MNHN) 1 f; Konakry (MNHN) 1 m; Konakry, Dr. MACLAUD 1895, (MNHN) 7 f, 3 m; N'Zébela, P. CHABANAUT 1920, Février, (MNHN) 3 m; Presqu'ile de Konakry, Camayenne, DUPORT 1909, (MNHN) 2 f, 1 m; Rives Inondées, (MNHN) 1 m; Rives du Moyen Chari, NIELLIMS, (MNHN) 1 m; Sérédou, 1974/75, leg. Dr. ZOTT, (ZMB) 9 m, 38 f; Tabouna, 1942, (MNHN) 11 m, 6 f;

Ivory Coast: Assinie, CHAPER, 1882, (MNHN) 1 f; Bassam Clouet, Grand Bassam CLOUET 7-55, (MNHN) 1 f; Bokalakala (Bolobo), 1954, R.C. ELOY, (MRAC) 1 m; Cote D'Ivoire, Man, 1930-1931, Ch. ALLUAUD & P. A. CHAPPUIS, (MNHN) 1 f; Cote occid. Afrique, Assinie, Ch. ALLUAUD 1886, Coll. L. FAIRMAIRE 1906, (MNHN) 1 f; N' Zida, Lepesme, ex. coll. R. OBERTHUR, 1948, (MNHN) 1 f; Reg. De San Pedro, D. THOIRÉ 1900, (MNHN) 2 m; Ranch de Sipilou, 30.III.1973, V. VILTARD Rec., (MNHN) 1 m, 1 f;

Kenya: Bamburi, Coll. P. ARDOIN 1978, 14.08.77. R.N., (MNHN) 1 f; Witu, Dana-Fl, DENHARDT, (ZMB) 1 f; Yala Rivier (prés Kisumu) B.E.A., G. BABAUT Sept. 1916, 1930, Coll. G. BABAUT, (MNHN) 1 m, Nov. 1916, (MNHN) 1 f, 1 m;

Kongo: Brazzaville, DEGEORGIS 1899, Congo Francais, (MNHN) 1 m; E. ROUBAUD & A. WEISS 1907, (MNHN) 1 f; Brassaville, E. BBOURVAL Collector, 1919-20, (ANSP) 1 m, 8 f; Brazzaville, XI.1974, (OSUC) 3 f; Congo Moyen, Rég. de M'Baiki, (D' Fidao), PITARD 1919, Février, (MNHN) 3 m, 3 f; Haute-Sanga, P.A. FERRIERE 106-97, Congo Francais, (MNHN) 3 f, 6 m, Carnot, Dr. J. KÉRANDEL 1908, Septembre, (MNHN) 1 m; Libreville, C. CHALOT 1901, Juillet-Septembre, Congo Francais, (MNHN) 2 f, 1 m;

Mozambique: Beira, (ZMH) 1 m; Moçambique, Prov. de Gorongoza, Tendos de L'uréma, G. VASSE 1907, Février, (MNHN) 1 m, 1 f;

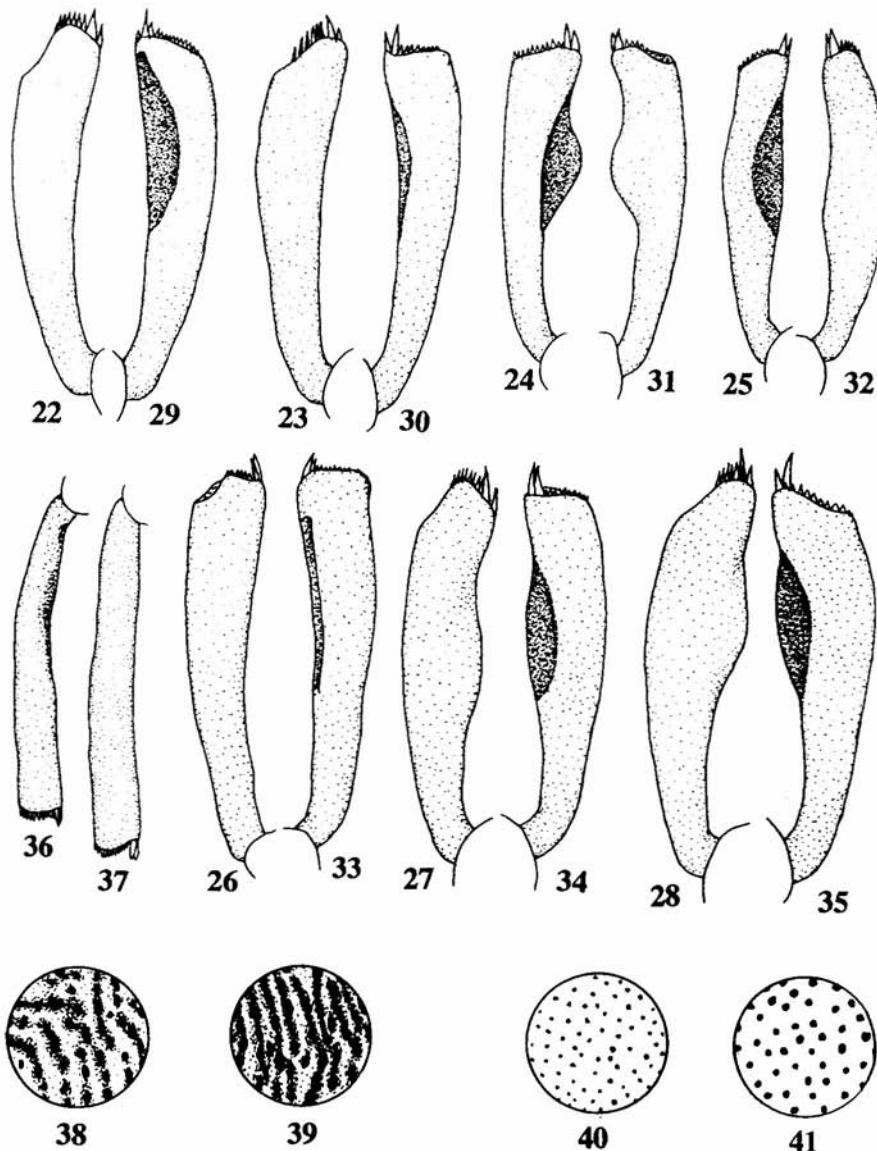
Nigeria: Niger River, (MNHN) 4 m, 4 f; Lokoja, Kabba, II.26.49., B. MALKIN, (TM) 2 f; Oyo, Yoruba, P. FRANÇOIS, (Coll. Ch. ALLUAUD), Coll. L. FAIRMAIRE 1906, (MNHN) 2 m; Oyo, Yoruba, P. FRANÇOIS, (TM) 1 m;

Portuguese Guinea: Bubaque, V.1960, BENASSI, (CISC) 1 f;

Rio Muni: Span. Guinea: Alcu Benitogbt, 16-31.VIII.06, G. TEßMANN S.G., (ZMB) 1 f; Makosuo Campoght, IV.06, G. TEßMANN S.G., (ZMB) 1 f; Nkolentangan, G. TEßMANN S.G., (ZMB) 1 f;

Senegal: Dakar, MOCQUERYS, Février 1889, (MNHN) 2 m, 3 f; Haut Sénégal, Khayes, D'NODIER, 6.8.1882, (TM) 1 m; Mion Hist. Coll 45772 (ZMB) 1 m; Thiés, (MNHN) 1 m;

Sierra Leone: ex coll THOMSON (IRSNB) 2 m, 4 f; (ZMK) 1 m; CLEMENTS, 1892, (MNHN) 1 f; Njale, 9.XI.1981, L.H. ROLSTON, UV Light, (OSUC) 3 f, 3 m;



22-35. Male protibia, dorsal and ventral view: 22, 29 - *Zidalus servus*, 23, 30 - *Z. attenuatus*, 24, 31 - *Z. corvinus*, 25, 32 - *Z. erythraeus*, 26, 33 - *Z. exalatus*, 27, 34 - *Z. mahaimi*, 28, 35 - *Z. costulatus*. 36-37. Male metatibia: 36 - *Z. servus*, 37 - *Z. corvinus*. 38-39. Punctuation of the prosternum: 38 - *Z. attenuatus*, 39 - *Z. servus*. 40-41. Punctuation of the prosternal process: 40 - *Z. attenuatus*, 41 - *Z. servus*.

Sudan: Equatoria Senambio, 14-15.4.1963, (ZMH) 1 f; N.O. Afrika: 28.IV.01, O. NEUMANN, (ZMB) 2 m, 2 f; O. Sudan, Gelo-Fl., O. NEUMANN S.V. (ZMB) 1 f;

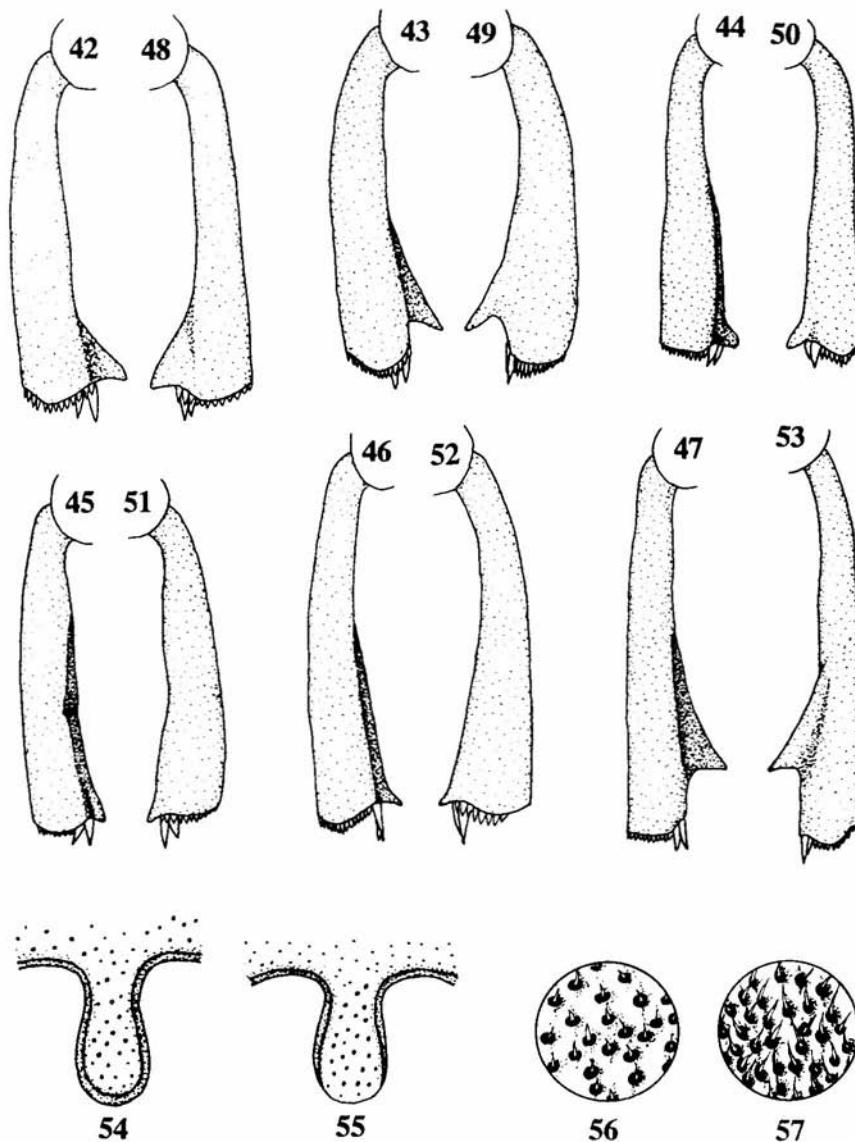
Tanzania: Afrique Orientale Allemande Mrogoro, Leroy 1889, (MNHN) 1 m; Bukoba, T.T., Nov. 1943, MENEGHETTI, (TM) 1 f, 2 m; D. Ost Afrika, Morogoro, XII.09., REUSZ S.G. (ZMB) 1 m; Kondoa, BLOYET 1885 (MNHN) 5 m, 5 f; Mwamgongo, T.T. Nov. 1943, MENEGHETTI, (TM) 1 m, 1 f; Tabora, Ounyanyembe, RP. HAUTTECOEUR 1 Trim 1885, (MNHN) 1 f; W. Ukami Itühlmann, Lumba, 28.II.57, (ZMB) 1 m; Zanguebar, R. P. LEROY, Coll. R. OBERTHUR, (MNHN) 1 m;

Togo: Bismarckburg, 7.III.93, I. CONRADT S, (ZMB) 1 f, 20-27.X.93, (ZMB) 1 f; CONRADT, Coll. KRAATZ, (NMW) 1 m; Togo Station Ho, SCHRÖDER S, (ZMB) 1 m, 1 f;

Uganda: Alb-Edw. See Karewia, 0°22'N, 6.VI.91, STUHLMANN S., Karewia a. Fuss d. Ru-Nassororo unter Steinet, (ZMB) 1 m, 4 f; Alber-see Mboga, 3.08., (ZMB) 1 m; Budongo Forest, V.1972, H. GØNGET, (ZMK) 8 f, 4 m; Bwamba Forest, 2500 ft., 3.1948, J. G. WILLIAMS, (TM) 1 m; Bwamba, dec. 1971, H. GØNGET, (ZMK) 2 m; Entebbe, 14-25 May, 1912, C.C. GOWDEY, 1912-462, (TM) 1 m; Kampala, (TM) 1 f; Kedong Valley, 26.II.1934, (ZMK) 1 f; Kisubi, 19.VI.1971, H. GØNGET, (ZMK) 1 m; Mubende, 10.1.23., H. HARGREAVES, (TM) 1 m; Murchison Falls, National Park, 24.IV.1983, G.G.M. SCHULTEN, (ZMAN) 1 f; Ruwenzori, Fort Beni, Exped. Herzog Adolf Friedrich z. MECKLENBURG, (ZMB) 1 m; Ruwenzori, Parc Nat. Albert, (1000-4000m), 1937, (MRAC) 2 f; Tororo 1300 m, 9.IX.1957, Mission Zoolog. I.R.S.A.C. en Afrique orientale, coll. P. BASILEWSKY et N. LELEUP, (MRAC) 1 f; Province D'Ounyoro, Rég. Est Albert Nyanza, Ch. ALLUAUD 1909, (MNHN) 1 m;

Upper Volta: Ob. Volta, Pundu, OLSUFLEW, (TM) 7 m, 8 f;

Zaire: Akam, 19.V.50, DS 531, (MRAC) 3 m, 3 f; Bagbele, 16.XII.49, D.S. 55, (MRAC) 1 f; Bambessa, VII.1955, (IRSNB) 5 f; Bambessa J. VRYDAGH, 1930/39, (MRAC) 12 m, 13 f, 11.IX.37., J. VRYDAGH, (TM) 1 m; Banana, Boma, M. TSCHOFFEN 91 (IRSNB) 2 m, 2 f; Beni Bendi, Sankura, L. CLOETENS/95 (IRSNB) 1 m; Beni Ituri Forest, October, 1946, T.H.E. JACKSON, (TM) 1 m; Bomokandi (sources), 26.nov.- 6.dec.1925, Prince LEOPOLD, (IRSNB) 1 f, 1 m; Bonana, Rec. F. BUSSCHODTS, (IRSNB) 1 m; Bussira (narusie), 1923, ex.coll. J. MULLER (IRSNB) 1 m; Chiloango, M. TSCHOFFEN (IRSNB) 1 f; Congo Isairghi, Balim (IRSNB) 1 f; Et Grand Lahou H. POBÉGUIN 1894, Museum Paris (MNHN) 1 f; Equateur, Bokuma, III.52, R.P. LOOTENS, (MRAC) 1 f; Forêt Semliki 900-1200 m, X/XI.37, HACKARS Park Nat. Albert, (MRAC) 1 f; Gangala, 31.X, 1.XI.1949, Réc. H. DE.SAEGER 6, (MRAC) 1 f; Isaugi Baltus (IRSNB) 1 m; Kassai, Edm. Taymans, 1904, (MNHN) 3 f; Kabinda, XII.34, Mme GILLARDIN, (MRAC) 1 f; Kaimosi, Mch, Apl.1932, A. TURNER, (TM) 3 f; Kasai, L. ACHTEU, (MRAC) 1 m; Katanga: Elisabethville, H.J. BRÉDO, 1. 1931, (MRAC) 1 f; Kinda, 1951, M. DIERCKX, (MRAC) 1 f; Nuonga, V.1925, G.F. DE WITTE, (MRAC) 1 f; Kibali-Huri, Luma (Djaliasiga), 1939, R.P. GÉRARD, (MRAC) 1 m, 1 f; Kisantu (ZMB) 2 m, 5 f; Kisantu, 1932, R.P. VANDERYST, (MRAC) 1 m; Lac Kivu, Kadjudju, 1930, Coll. G. BABAUT, (MNHN) 1 m; Lac Kivu, Kitembo, (MNHN) 3 m, 4 f; Lemera, terr. Uvira, XII.1956, 1600 m, N. LELEUP, (MRAC) 13 m, 10 f; Leopoldville, ex coll. J. MULLER (IRSNB) 1 f; Léopoldville, II.1951, P. JOBELS,



42-53. Male mesotibia, ventral and dorsal view: 42, 48 - *Zidalus mahaimi*, 43, 49 - *Z. costulatus*, 44, 50 - *Z. latipes*, 45, 51 - *Z. attenuatus*, 46, 52 - *Z. servus*, 47, 53 - *Z. burakowskii*. 54-55. Prosternal process: 54 - *Z. exalatus*, 55 - *Z. mirabilis*. Punctuation of the pronotum: 56 - *Z. mahaimi*, 57 - *Z. costulatus*

(MRAC) 1 m, 1 f; Leverville, 1928, Mme J. TINANT, (MRAC) 1 f; Luebo Luluabourg, 1921, L.J. GHEQUIÈRE, (MRAC) 1 m, 1 f; Luebo P.E.A., I.1958, P. VSHER, (TM) 1 f; Lulua, Kapanga, F.G. OVERLAET, 1932/33, (MRAC) 6 m, 11 f, (TM) 1 m; Lulua, Tshibalaka, F.G. OVERLAET, 1.4.X.1933, (MRAC) 1 m, 1 f; Mande, 5.IV.50, D.S. 381, (MRAC) 2 m, 2 f; Maniema, Kasongo, IX.36, P. HEURARD, (MRAC) 1 f; Maniema, Kindu, L. BURGEON 1917, (MNHN) 4 m; Mambasa, 29.2.1946, (ZMK) 1 f; Morubia, 14.VI.1951, Réc. J. VERSCHUREN 1929, (MRAC) 1 m; Mt. Embe, 20.IV.52, DS 3359, (MRAC) 2 f; Mukinge, Togge, (ZMB) 2 m; Nagero, 4/30.VII.54, C. NEBAY, P.N.G., (MRAC) 2 m, 10 f; Nyange, III.1920, L. GHEQUIÈRE [coton], (MRAC) 2 m, 1 f; Pidigala, 23.IV.51, DS 3328, (MRAC) 5 m, 4 f; P.K. ROUGE, I.1979, Onore, (CISC) 1 f, 1 m; Plaine de la Ruindi, Au Sud du Lac Edouard, 3.IV.1932, V.VAN STRAELEN, (IRSNB) 1 f; P.N.G., Miss. H. DE SAEGER, 1951/52, Réc. H. DE SAEGER, J. VERSCHUREN, G. DEMOULIN and P. SCHOEMAKER, (MRAC) 198 m, 238 f; Sankuru, Gandajika, 1956, P. DE FRANCQUEN, (MRAC) 1 f; Sandoa, XII.1931, G.F. OVERLAET, (MRAC) 1 f; Stanleyville a Kilo, L. BURGEON, (MRAC) 1 f; Tchissundu (Tshikapa), XI.'48, (TM) 1 m; Voka, 1977-78, G. ONORE, (CISC) 3 m, 1 f; Tshuapa, Ikela, XI.1956, R.P. LOOTENS, (MRAC) 1 m, 3 f; Zoulouabourg, Ch. HAAS (IRSNB) 1 m.

TYPES

Opatriinus ovalis MULSANT et REY, 1853 - lectotype (male) and paralectotype (female); MNHN; "*Opatriinus ovalis* DI., Senegalio, Type de MULSANT et REY, *Opatriinus ovalis*, col. L. FAIRMAIRE, Museum Paris, collection Leon FAIRMAIRE, 1905"; (present designation).

Opatriinus atratus QUEDENFELDT, 1885 - holotype (male); MNHN; "*Opatriinus atratus* QDF., n. sp., Type, Museum Paris, Coll. R. OBERTHUR, Col. R. OBERTHUR ex col. QUEDENFELDT" (examined).

DISTRIBUTION

Angola, Botswana, Burundi, Cameroon, Central African Republic, Dahomey, Ethiopia, Fernando-Poo, Gabon, Ghana, Guinea, Ivory Coast, Kenya, Kongo, Liberia, Mozambique, Nigeria, Portuguese Guinea, Rio Muni, Senegal, Sierra Leone, Sudan, Tanzania, Togo, Uganda, Upper Volta, Zaire.

Zidalus burakowskii sp. nov.

NAME DERIVATION

Named in honour of Dr. B. BURAKOWSKI, an outstanding Polish entomologist.

Locus typicus: Kankan (Guinea)

DIAGNOSIS

The species is a member of the *latipes* group, and like *latipes* it has well developed wings (reduced in *exalatus* and *royi*) and elongate metasternum.

If differs from *latipes* in the structure of male mid tibiae, mat, silky sheen (in *latipes* dorsal body side glossy) and shape of pronotum (fig. 16).

DESCRIPTION

Length 12.2-12.4 mm. Body mat black (fig. 99). Head and pronotum coarsely punctured, distance between punctures smaller than puncture diameter. Pronotum: $pl/pb = 0.71-0.73$, sides moderately rounded, posterior angles sharp. Elytra: $el/eb = 1.61-1.63$, $el/pl = 2.88-2.95$, $eb/pb = 1.25-1.27$, row IV of 65-72 punctures. Wings fully developed, $ml/avl = 0.89-0.92$, $mc = 1.14-1.18$. Male fore tibia slightly distended apically, mid tibia with a large denticle before the apex (figs 47, 53), hind tibia arcuately bent. Shiny, bare gutters on the underside of tarsi as in *latipes*. Aedeagus as in figs 87-89.

TYPES

Holotype (male) and paratype (female); TMB; "11.06.62, Kankan, Guinea, Afrika, legit. Dr. SABACKY".

DISTRIBUTION

Guinea.

***Zidalus royi* (ARDOIN, 1965) comb. nov.**

Apterozidalus royi ARDOIN 1965b: 1316; ARDOIN 1971: 283.

Terra typica: Monts Loma (Sierra Leone).

DIAGNOSIS

It belongs to the *latipes* group. Like *exalatus*, it has reduced wings and shortened metasternum.

It differs from *exalatus* in more protruding eyes (fig. 5) and the absence of the gutter on the first basal segment of female fore tarsi.

DESCRIPTION

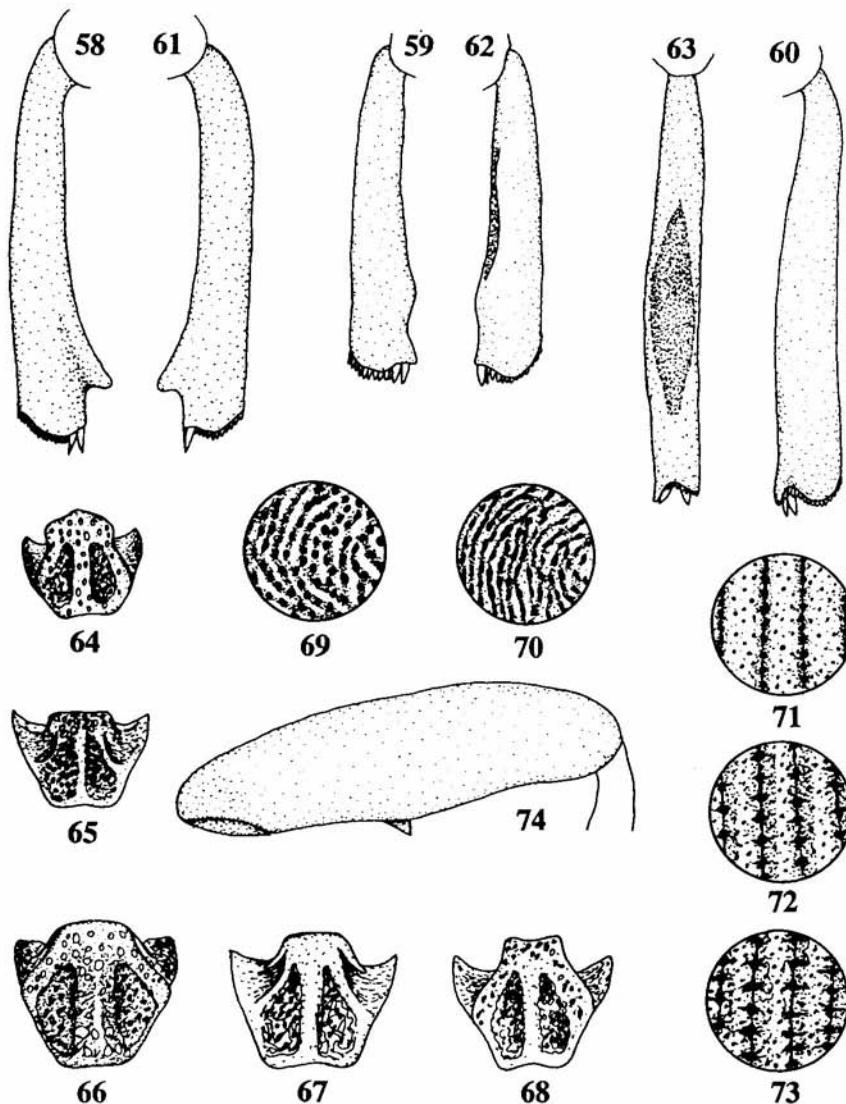
Body length 11.2-14.5 mm, $pl/pb = 0.63-0.68$, $el/eb = 1.45-1.55$, $el/pl = 2.75-2.83$, $eb/pb = 1.15-1.23$, $ml/avl = 0.68-0.72$, $mc = 0.70-0.71$, shiny, bare gutters on the underside of tarsi as in *latipes*.

MATERIAL EXAMINED

Sierra Leone: Mission ENS-IFAN aux Monts Loma, Sav. MIRAMIRA al., 1535-1830 m, 1964, (MNHN) 50 m, 54 f, Sav. SHULTZE 1280-1320 m, (MNHN) 2 m, 3 f.

TYPES

Apterozidalus royi ARDOIN 1965 - Holotype (male) and allotype (female); MNHN; "Savane 1150 m, 19.V.1963, Mission ENS - IFAN, aux Monts Loma, Sierra Leone" (examined).



58-63. Male mesotibia, dorsal and ventral view: 58, 61 - *Zidalus erythraeus*, 59, 62 - *Z. corvinus*, 60, 63 - *Z. exalatus*. 64-68. Mentum: 64 - *Z. servus*, 65 - *Z. niloticus*, 66 - *Z. latipes*, 67 - *Z. erythraeus*, 68 - *Z. corvinus*. 69-70. Punctuation of the prosternum: 69 - *Z. exalatus*, 70 - *Z. latipes*. 71-73. Punctuation of elytral rows: 71 - *Z. latipes*, 72 - *Z. niloticus*, 73 - *Z. insularis*. 74. Male metafemur, *Z. attenuatus*

DISTRIBUTION
Sierra Leone.

REMARKS

In 1965 ARDOIN erected a new, monotypic genus *Apterozidalus* for the newly described species *A. royi*. The main distinctive character of this genus was a complete reduction of wings and a shortening of the metasternum. After examining the type specimens of *A. royi* ARDOIN, I think that the specific structure of male tibiae and the presence of two elongate sclerites in female spermatheca, as well as the distribution area, testify to its close relationship with species of the group *Zidalus latipes* (SAHLB.). The group includes also wingless *Z. exalatus* (KOCH). Thus *A. royi* ARDOIN should be included in the genus *Zidalus* M.&R., and *Apterozidalus* ARDOIN should be regarded as a synonym of *Zidalus* M.&R.

***Zidalus exalatus* (KOCH, 1956) comb. nov.**

Opatriinus exalatus KOCH, 1956: 104; KULZER 1963: 375.

Locus typicus: Colmant (Zaire).

DIAGNOSIS

Like *royi*, it has reduced wings and shortened metasternum (well developed in *latipes* and *burakowskii*).

Eyes little protruding (fig. 7), in the narrowest part between genae and tempora 3 facets (4 facets in *latipes*, *burakowskii* and *royi*). In females bare gutter present also on the first basal segment of fore tarsi (absent in *latipes*, *burakowskii* and *royi*).

DESCRIPTION

Body length 11.3-12.8 mm, $pl/pb = 0.59-0.64$, $el/eb = 1.29-1.41$, $el/pl = 2.35-2.81$, $eb/pb = 1.19-1.25$, $ml/avl = 0.68-0.69$, $mc = 0.83-0.91$, shiny, bare gutters on the underside of tarsi in males on 1-2 ht, in females on 1 ft, 1 mt and 1-2 ht. Aedeagus as in figs 78-80.

TYPES

Lectotype (male) and paralectotypes (3 m, 2 f); TM; "Musée du Congo, Région de Sassa 1895-96, COLMANT" (present designation).

DISTRIBUTION
Zaire.

***Zidalus mirabilis* (KOCH, 1956) comb. nov.**

Opatriinus mirabilis KOCH, 1956: 109.

Locus typicus: Mabwe (Zaire).

DIAGNOSIS

Like *latipes*, *burakowskii* and *royi*, it has moderately protruding eyes (in the narrowest place between genae and tempora 4 facets) (fig. 6). Fine puncturation of elytral rows (c. 65 punctures in row IV) place it close to the groups *latipes* and *servus*.

It is the only species of *Zidalus* with strongly modified male antennae and fore femora (KOCH 1956).

DESCRIPTION

Body length 13.6-14.0 mm, $pl/pb = 0.70-0.72$, $el/cb = 1.46-1.49$, $el/pl = 2.74-2.83$, $cb/pb = 1.26-1.40$, $ml/avl = 0.89-0.91$, $mc = 1.14-1.19$. Shiny, bare gutters on the underside of tarsi as in *exalatus*.

MATERIAL EXAMINED

Zaire: Musée Congo, Katanga, Nyonga, V.1925, G. F. DE WITTE, (TM) 1 f.

TYPES

Opatriinus mirabilis KOCH, 1956 - lectotype (female) and paralectotypes (2 f); TM; "Congo Belge, P.N.U., Mabwe (lac Upemba), (585 m.), 1-8-IX-1947, Mis. G. F. DE WITTE, 733 a"; (present designation).

DISTRIBUTION

Zaire.

REMARKS

Unfortunately, the only known male of the species (type specimen) has been damaged, and thus it was impossible to examine male characters of *mirabilis*; this forced me to designate the lectotype from among the females of the type series designated by KOCH (1956).

***Zidalus corvinus* (Mulsant et Rey, 1853) comb. nov.**

Opatriinus corvinus MULSANT ET REY, 1853a: 296; 1853b: 71; GEMMINGEN AND HAROLD 1870: 1915; BAUDI 1876: 36; FAIRMAIRE 1887: 283; REITTER 1904: 77; GEBIEN 1910: 276; KOCH 1935: 80; GEBIEN 1938: 296; GRIDELLI 1940: 238; ESPAÑOL 1943: 139; GRIDELLI 1947: 40; KOCH 1956: 94; KASZAB 1963: 344; ARDOIN 1972b: 8.

Opatriinus corvinus var. *pinheyi* KOCH 1956: 96.

Locus typicus: Galam (Somalia).

DIAGNOSIS

With *erythraeus* it forms a group characterized by a specific shape of pronotum (fig. 20) whose posterior angles are straight.

It differs from *erythraeus* in the absence of denticle on male mid tibia and the bordering of the last abdominal ventrite.

DESCRIPTION

Body length 11.2-14.0 mm, pl/pb = 0.64-0.75, el/cb = 1.48-1.63, el/pl = 2.33-2.89, eb/pb = 1.13-1.19, ml/avl = 0.93-1.04, mc = 1.13-1.36. Shiny, bare gutters on the underside of tarsi in males on 1-3 ht, in females on 1 ft, 1-4 mt and 1-3 ht.

MATERIAL EXAMINED

Cameroon: Diangai, 29.VI.09, RIGGENBACH S.G. (ZMB) 2 m, 1 f;

Chad: Nr. 3278, Fort Lamy, Rive S.-E. du lac. Tchad-A.E.F, 10-14-12-1935, Mission D'études, De la Biologie des Acridiens, (MNHN) 1 m; Fort - Lamy, XI.1959 (p. RENAUD), ex. coll. Dr. BREUNING, (TMB) 1 m; iles du lac, XI/XII.1957, (MRAC) 1 f;

Egypt: (NMW) 1 m; (ZMB) 2 m; (ZMK) 1 f; ex coll. J. DESBROCHERS (IRSNB) 3 m, 1 f; Coll. REITTER, (TMB) 1 f; REITTER, O. LEONHARD, (DEI) 1 m; Coll. STIERLIN, (DEI) 1 m; Cairo, nr 681, (ZMB) 1 m, 2 f; Cairo, (ZMH) 1 f; Coll. W. LIEBMANN, Arnstadt, Asyut Egitto, (DEI) 2 m, 3 f; Cairo, (ZMH) 3 f; El Wasta Aeg., (NMW) 1 f; Coll. C & O. VOGT Acq 1960, Han Dinger, (ZMAN) 7 m, 6 f; Vasta, (TMB) 1 f; Vasta, (ZMH) 1 m; Walse (DEI) 6 m, 5 f;

Ethiopie: Delta de l'Omo, Lac Rodolphe, Mission de l'Omo, C. ARAMBOURG, P.A. CHAPPUIS & R. JEANNEL, 1932-33, 570 m. (MNHN) 3 f; Ilubabor, Prov. Hang, 25.VIII.1972, (MRAC) 2 f, (TMB) 1 m; Gembi nr. Agaro 15.6.1963, (ZMH) 1 f;

Kenya: 5.IV.1988, Victoria See-Gebiet, Straße Homa Bay, H. J. BREMER legit, (HBC) 4 ex.;

Mauretania: Boghe X.1968, leg. H. POLITZAR, (TMB) 1 m;

Sudan: Blue Nile, Wad es Zaki, 10.5.1963, (ZMH) 2 m; Debeira, 6-13.10.1962, (ZMH) 1 f; Upper Nile, Malakal, 5-20.I.1963., (ZMH) 1 f; W. Halfa dist Gezirah Saras, (ZMH) 1 f; Syrian Taubi, Coll. REITTER, (TMB) 1 m, 1 f; Weisser Nil, Taufikiat, (TMB) 1 m.

TYPES

Opatriinus corvinus MULSANT and Rey, 1853 - lectotype (male); MNHN; "Type de MULSANT et REY, ex. L. FAIRMAIRE, *Opatriinus corvinus*; *Opatriinus Zidalus corvinus* (WALTL), *aegiptiacus* DEJ., Africa occ. Galam; Museum Paris Collection L. FAIRMAIRE 1906, Egypte v. Nelly"; paralectotypes (2 males i 1 female); MNHN; "*O. corvinus* WALTL; 231; Galam Luprinus; Museum Paris, Senegal Galam, LEPRIEUR 9652-34, Syntype" (present designation).

DISTRIBUTION

Cameroon, Chad, Egypt, Ethiopie, Kenya, Mauretania, Senegal, Somalia, Sudan, Upper Volta* (* literature data).

Zidalus erythraeus (GRIDELLI, 1940) comb. nov.

Opatriinus corvinus erythraeus GRIDELLI, 1940: 239; GRIDELLI 1947: 41.

Opatriinus erythraeus GRIDELLI: KOCH 1956: 97.

Locus typicus: Tessenei (Etiopia).

DIAGNOSIS

A member of the *corvinus* group.

The structure of male mid tibiae and the absence of bordering of the last abdominal ventrite distinguish it from *corvinus* (see diagnose of *corvinus*).

DESCRIPTION

Body length 10.6-13.9 mm, $pl/pb = 0.62-0.69$, $el/eb = 1.38-1.60$, $el/pl = 2.40-2.82$, $eb/pb = 1.12-1.20$, $ml/avl = 0.91-1.00$, $mc = 1.09-1.31$. Shiny, bare gutters on the underside of tarsi in males on 1-3 ht, in females on 1-4 ft, 1-4 mt and 1-3 ht.

MATERIAL EXAMINED

Chad: Bas Chari, Fort Lamy, Mission Chari-Tchad, Dr. J. DECORSE 1904; Aout, (MNHN) 22 m, 19 f; Fort Archambault, 23.XI.1964, J. P. BESSON leg., Coll. P. ARDOIN 1978, (MNHN) 1 f; Fort Lamy, (MNHN) 1 m; près Fort Lamy, 6.XI.1966 Farcha J. GRUVEL leg., Coll. P. ARDOIN 1978, (MNHN) 2 f; Fort Lamy, 15.IV.1966, J. P. BESSON leg., Coll. P. ARDOIN 1978, (MNHN) 1 f;

Egypt: Egypte, d'Alexandrie, IV-V.1943, J. BERBIER leg., Coll. P. ARDOIN 1978, (MNHN) 1 f;

Niger: env. d'Agadés, Nov. 1938, 1938-39, L. CHOPARD, (MNHN) 1 m; Germari 9.VII.75, D. ROUGON, Coll. P. ARDOIN 1978, (MNHN) 1 m;

Senegal: (NMW) 1 m;

Somalia: 1959, (TM) 1 m; Duca Abruzzi, V. FIECHTER, (TM) 1 f;

Sudan: Blue Nile, Umm Banein, 14.11.1962, (ZMH) 1 m, 2 f; Nr. mouth of Dinder R. (Blue Nile), 26.7.09, S.S. FLOWER, 1910-22, (TM) 1 m; Omdurman Khartoum, X.1962, P. JOLIVET réc., Coll. P. ARDOIN 1978, (MNHN) 1 m, 2 f; Sennar, 1.X.1962, P. JOLIVET., Coll. P. ARDOIN 1978, (MNHN) 1 f; Province de Sennar, Ch. ALLUAUD 1906, Coll. Ch. ALLUAUD, 1924, (MNHN) 1 f;

Tanzania: O. Afrika, Manyara - See, XI.93, O. NEUMANN S., (ZMB) 1 m.

DISTRIBUTION

Chad, Egypt, Ethiopia*, Niger, Senegal, Somalia, Sudan, Tanzania.

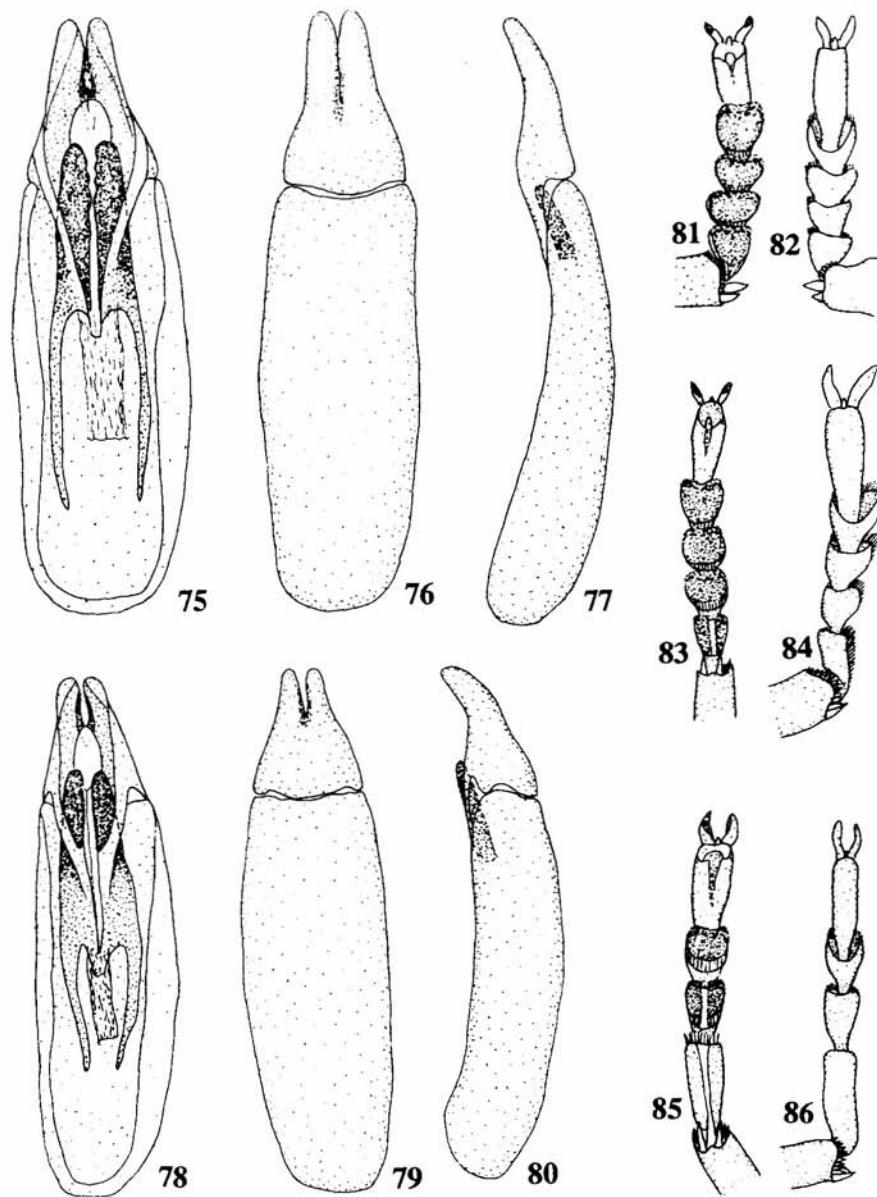
Zidalus insularis (MULSANT et REY, 1853) comb. nov.

Opatriinus insularis MULSANT et REY, 1853a: 320; 1853b: 95; GEMMINGER and HAROLD 1870: 1915; GEBIEN 1910: 277; CHATANAY 1913: 765; GEBIEN 1922: 273; 1938: 296; GRIDELLI 1947: 50; KOCH 1956: 101.

Opatriinus ater MUELLER, 1887: 301; GEBIEN 1910: 276; 1922: 273; 1938: 296.

Opatriinus insularis somalicus GRIDELLI, 1947: 51; KOCH 1956: 101.

Terra typica: Madagascar.



75-80. Aedeagus, ventral, dorsal and lateral view: 75-77 - *Zidalus royi*, 78-80 - *Z. exalatus*. 81-86. *Z. latipes*, female tarsi, ventral and dorsal view: 83-84 - protarsi, 85-86 - mesotarsi, 87-88 - metatarsi

DIAGNOSIS

The species has the same arrangement of bare gutters on the underside of tarsi, as the groups *latipes* and *servus*, and *mirabilis*. It differs from them in the coarse puncturation of elytral rows (c. 30 punctures in row IV) and in moderately protruding eyes (3 facets between genae and tempora, fig. 19). At the base of pronotum it has two longitudinal concavities (fig. 21) and its wings are partly reduced (fig. 2).

DESCRIPTION

Body length 9.6-11.9 mm, $pl/pb = 0.63-0.73$, $el/eb = 1.34-1.46$, $el/pl = 2.25-2.60$, $eb/pb = 1.14-1.21$, $ml/avl = 0.73-0.82$, $mc = 0.64-0.90$.

MATERIAL EXAMINED

Comoren Archipelago: Gr. Comoro, I.M., XI.52, (TM) 2 f, Moheli Fomboni, Institut Scientifique, XI.55-A.R, (MNHN) 1 f, Mayotte, Mamoutzon, A.R., II.56, (TM) 2 m, 4 f; Mayotte, Ch. ALLUAUD 1897, I. PAMANZI, (MNHN) 3 m, 4 f;

Madagascar: (NHMB) 1 m; Coll. J. CHATANAY 1914; Coll. SCHRAMM, (MNHN) 1 f; Ambanja, Mahilaka, Institut Scientifique VIII-59 R.E, (MNHN) 1 m, 3 f; Loucoubé, STUMPT 1878, (ZMK) 1 f; Nossi-Bé, Coll. J. CHATANAY 1914, (MNHN) 6 m, 9 f; Nossi-Bé, (Pierron) Coll. A. BONHOURE 1909, (MNHN) 16 m, 14 f; Sainte Marie, Cloue 1847, (MNHN) 1 m; Nossi-Be, 1935, Coll. SEDILLOT, (MNHN) 16 f, 2 m; Institut Scientifique, Sambirano, Ilosy-Be, Hell-Ville-Andilana, X-59 R.E, (MNHN) 1 m, 2 f;

Kenya: Arabuko Forest, T.H.E. JACKSON, Malindi, 6.40, (TM) 1 m; S. Malindi loatamu, Apr.-Mai 1980, leg. BURMEISTER, (RGC) 1 f;

Somalia: Giohar 3.VIII.68, leg. S.B.S. Coll. P. ARDOIN, 1978, (MNHN) 2 m; Mogadiscio, Balad, VIII.1959, (TM) 1 m; Nguela, Usambare, (TM) 1 f;

Tanzania: Zanzibar, R.P. GUILLEMÉ, 1952, Coll. R. OBERTHUR, (MNHN) 2 m, 2 f; Zanguebar, R.P. Leroy, 1952, Coll. R. OBERTHUR, (MNHN) 3 m, 4 f; RAFFRAY, (MNHN) 1 f;

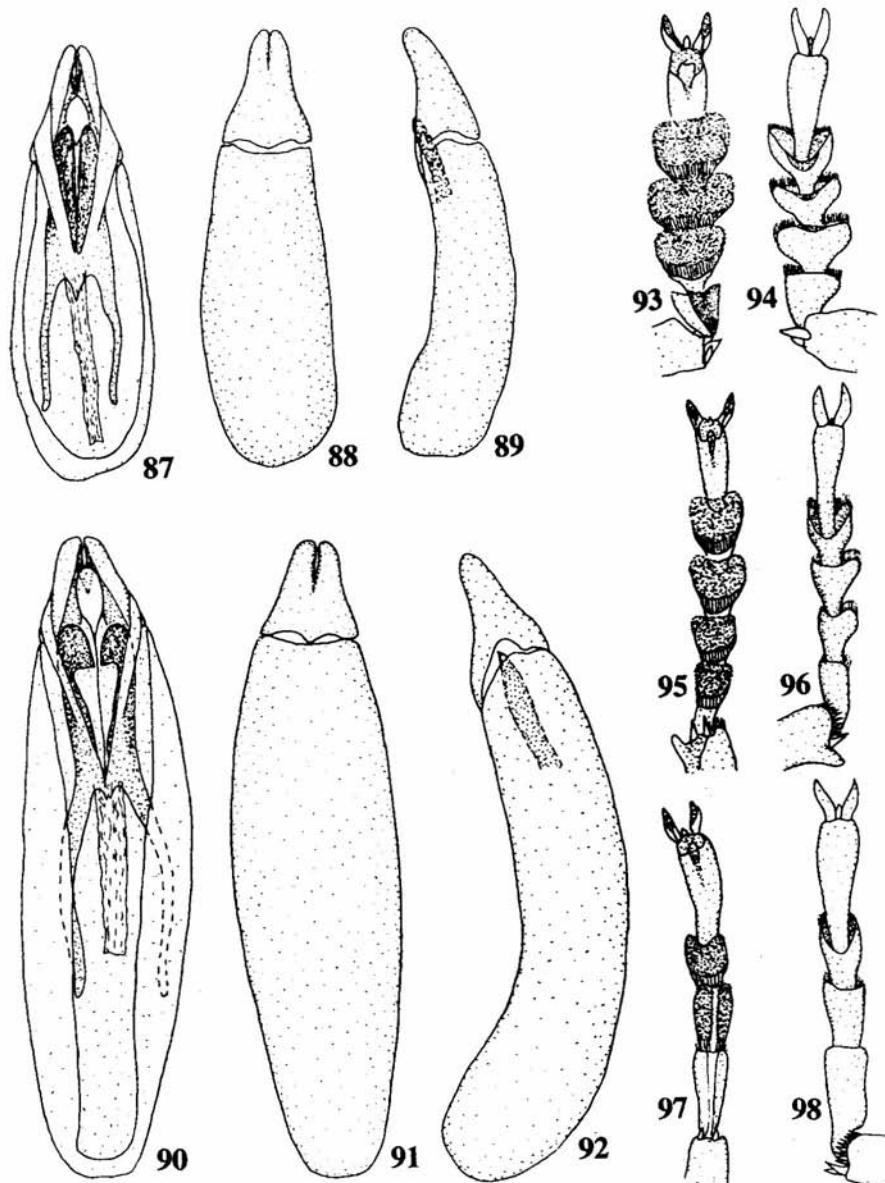
Zaire: Congo, DYBOWSKI 128-96, (MNHN) 1 f.

TYPES

Opatrinus insularis MULSANT et REY, 1853 - lectotype (male), MNHN, "Type de MULSANT et REY ex L. FAIRMAIRE; *Opatrinus insularis*, type, Madagascar; Museum Paris, Collection Leon FAIRMAIRE, 1906; Type; *Opatrinus insularis*" and paralectotype (female), MNHN, "Type; *Opatrinus insularis* MULS., Madag.; 164; Type MULSANT; Museum Paris, Madagascar, coll. Ach. DEYROLLE, 1865, A. GRANDIDIER, 1875" (present designation).

DISTRIBUTION

Comoren Archipelago, Madagascar, Kenya, Somalia, Tanzania, Zaire.



87-92. Aedeagus, ventral, dorsal and lateral view: 87-89 - *Zidalus burakowskii*, 90-92 - *Z. latipes*.
 93-98. *Z. latipes*, male tarsi, ventral and dorsal view: 93-94 - protarsi, 95-96 - mesotarsi, 97-98 - metatarsi

Zidalus niloticus (MULSANT et REY, 1853) comb. nov.

Opatriinus niloticus MULSANT et REY, 1853a: 312; 1853b: 87; GEMMINGER and HAROLD 1870: 1915; GEBIEN 1910: 277; 1938: 296; ESPAÑOL 1943: 138; GRIDELLI 1947: 51; 1950: 170; KOCH 1956: 98; LINDBERG 1962: 43; ESPAÑOL and LINDBERG 1963: 15; KASZAB 1963: 344; ARDOIN 1972b: 8; GEISTHARDT 1984: 72; GRIMM 1986: 75.

Tenebrio olivensis WOLLASTON, 1864: 501; syn. KULZER 1960: 317.

Opatriinus angulicollis FAIRMAIRE, 1887: 283; GEBIEN 1910: 276; 1938: 296; ESPAÑOL 1943: 139; syn. GRIDELLI 1947: 52.

Opatriinus niloticus zolotarevskyi ESPAÑOL, 1943: 138; KOCH 1956: 98.

Opatriinus niloticus angulicollis FAIRM.: GRIDELLI 1947: 52; KOCH 1956: 98.

Opatriinus niloticus var. *edentatus* KOCH, 1956: 99.

Terra typica: Egypt.

DIAGNOSIS

It shares with the *corvinus* group wrinkles in elytral intervals and a similar arrangement of bare gutters on the underside of tarsi. Like in *erythraeus*, lateral margins of the mid part of mentum do not reach mentum sides (fig. 65). Like in *insularis* and the *corvinus* group, the elytral row puncturation is coarse (c. 39 punctures in row IV), and eyes are feebly protruding (3 facets between genae and tempora fig. 11).

It is the only species of *Zidalus* with the arrangements of connections between elytral rows the same as in American members of *Opatriinus* (1-9, 2-7, 3-6, 4-5, 8 free).

DESCRIPTION

Body length 11.8-13.7 mm, pl/pb = 0.67-0.69, el/eb = 1.48-1.58, el/pl = 2.63-2.72, eb/pb = 1.17-1.23, ml/avl = 0.89-1.00, mc = 1.14-1.42. Shiny, bare gutters on the underside of tarsi in males on 1 mt, 1-3 ht, in females on 1-4 ft, 1-4 mt and 1-3 ht.

MATERIAL EXAMINED

Ethiopia: Abyssinie, Diré-Daoua, 1936, (MNHN) 1 f; Ethiopie Merid, Delta de l'Omo, Lac Rodolphe, 570 m., Mission de l'Omo, C. ARAMBOURG, P.A. CHAPPUIS & R. JEANNEL, 1932-33, (MNHN) 1 f; Harrar, Coll. P. KUNTZ, (MNHN) 1 f; Lac Rodolphe, Pays Tourkouana, (Alt. 640-1010 m) VI-VII, Mission, Du Bourg de BOZAS 1903, (MNHN) 1 m; Makalle, Erit, 8.1960, C. GREATHEAD, (TM) 1 f;

Kenya: Amboseli Nat. Park, Amboseli Serena Lodge, 23.3.1988, R. GRIMM, (RGC) 1 m, 2 f; Kapili Plains, 40 m S Nairobi, (ZMK) 1 f; Mt. Kulal, 8.I.1934, H. B. BEUZON, (ZMK) 1 f; Turkana Nord, 750 m, pris à la lumière, Mission de l'Omo, C. ARAMBOURG, P.A. CHAPPUIS & R. JEANNEL 1932-33, (MNHN) 1 f;

Niger: 38 km S Agadez, 2.8.1981, R. GRIMM, (RGC) 2 m, 3 f; Arlit (Aer), VIII.69, R. VILLEMAIN, (MNHN) 2 m, 2 f;

Somalia: Afgoi, 13.VIII.1959 (TM) 1 m; Afgoi, 20-4-1974, v. Fun Aioli, (MNHN) 1 m, 3 f; Côte Francaise, des Somalis, Plateau de Dai, 1500 m. Mt Goudah, 1937-38, Aubert de la Rue, (MNHN) 2 m, 3 f; Mogadiscio, 7° Km, 22/4-5/5/1984R, MOURGLIA legit, (MRAC) 2 f;

Sudan: Blue Nile Umm Banein, 14.11.62, (ZMH) 1 m; Blue Nile Wad Medani, 11-14.11.62, (ZMH) 2 m, 1 f; Damer-Shendi, 1-2.11.1962, (ZMH) 3 m, 4 f; Kassala-Houya, 1-3.12.62, (ZMH) 3 m, 4 f; Nubia, (NMW) 1 m, 1 f; Soudan Egyptien, Province de Sennar, Ch. ALLUAUD 1906, Coll. Ch. ALLUAUD, 1924, (MNHN) 1 f; Soudan Egyptien, Khartoum, Et Environs, Ch. ALLUAUD 1906, Coll. Ch. ALLUAUD 1924, (MNHN) 2 m;

Tanzania: Tanganyika Terr., Longido, Masoi Distr., 1500 m, 17/20.IV.57, Mission Zoolog., I.R.S.A.C., en Afrique orientale, (P. BASILEWSKY et N. LELEUP), (MRAC) 4 m, 3 f; Longido, N. Tang, XII.1961, P. DE MOOR, (TM) 1 m, 2 f.

TYPES

Opatriinus angulicollis FAIRMAIRE, 1887 - holotype (male), MNHN, "Guelisi; Type; Museum Paris, Collection L. FAIRMAIRE, 1906; *Opatriinus angulicollis* FAIRMAIRE, Guelidis" (examined).

DISTRIBUTION

Canara Is.*; Ethiopia, Kenya, Mauretania*, Niger, Somalia, Sudan, Tanzania, Yemen*.

Zidalus costulatus (GUÉRIN, 1849) comb. nov.

Opatrium costulatum GUÉRIN, 1849: 321.

Opatriinus costulatus GUÉRIN: GEMMINGER and HAROLD 1870: 1915; MÜLLER 1887: 301; GEBIEN 1910: 276; 1938: 296; GRIDELLI 1940: 239; 1947: 48; KOCH 1956: 110; ARDOIN 1972b: 8.

Terra typica: Abissinia (Ethiopia).

DIAGNOSIS

The species belongs to the *servus* group (strongly protruding eyes, fig. 12). Like in *mahaimi*, the male fore tarsi are strongly broadened (fig 28, 35), and mid tibiae are provided with a large denticle (before the apex in *costulatus*, apical in *mahaimi*, figs 43, 49).

The dorsal body side in *costulatus* is strongly hairy (poorly so in the remaining species of the group) (fig. 57).

DESCRIPTION

Body length 9.8-13.0 mm, pl/pb = 0.57-0.62, el/eb = 1.39-1.54, el/pl = 2.92-3.58, eb/pb = 1.22-1.32, ml/avl = 0.92-0.96, mc = 1.25-1.67. Shiny, bare gutters on the underside of tarsi like in *latipes*.

MATERIA EXAMINED

Cameroon: Cameroun, Yaoundé, J. VADOX IX.30, (MNHN) 1 f;

Ethiopie: Abyssinie, Mission DE BONCHAMPS Ch. MICHEL & M. POTTER 1899, (MNHN) 1 f, 1 m; Gimma, A.O.I., VII.1939, (TM) 1 m, 1 f; A. RAFFRAY, Voy. 1881, (MNHN) 1 m, RAFFRAY 1882, (MNHN) 1 m, 1 f; Ilubabor, Prov. Hang, 25.VIII.1972, (MRAC) 1 f; 16 km S-W de Jimma, V/VII 1971, (MRAC) 1 m, 1 f; Gembi nr. Agaro, 15.VI.63, (ZMH) 1 f;

Zaire: Congo Belge, Garamba, Réc. J. SCHOEMAKER, Réc. J. VERSCHUREN, (MRAC) 1 m, 6 f; Kivu, Uvira Lemera 1550 m, 11.II.51, N. LELEUP, (MRAC) 1 f; Congo Belge, P.N.G., Miss. H. DE SAEGER, 1950/52, Réc. H. DE SAEGER, J. VERSCHUREN, G. DEMOULIN and P. SCHOEMAKER, (MRAC) 128 m, 130 f; Djugu, V.35, H.J. BRÉDO, (MRAC) 1 f; Elisabethville (A la lumiere), XI.50/VI.51, Ch. SEYDEL, (MRAC) 1 f; Ituri, Nioka, 1934, L. LEROY, (MRAC) 2 m, 5 f; Mahagi-Niarembe, 1935, Ch. SCOPS, (MRAC) 3 m, 3 f.

DISTRIBUTION

Cameroon, Ethiopie, Zaire.

***Zidalus servus* (MULSANT et REY, 1853) comb. nov.**

Opatinus servus MULSANT et REY, 1853a: 317; 1853b: 92; GEMMINGER and HAROLD 1870: 1915; GEBIEN 1910: 277; GEBIEN 1938: 296; GRIDELLI 1947: 45; KOCH 1956: 112; ARDOIN 1963: 222; KASZAB 1963: 344.

Opatinus setuliger MUELLER, 1887: 301; GEBIEN 1910: 277; GEBIEN 1938: 296; GRIDELLI 1947: 43; KOCH 1956: 116; KASZAB 1963: 344; *syn. nov.*

Opatinus setuliger camerunensis GRIDELLI, 1947: 44; KOCH 1956: 117.

Terra typica: Guinea.

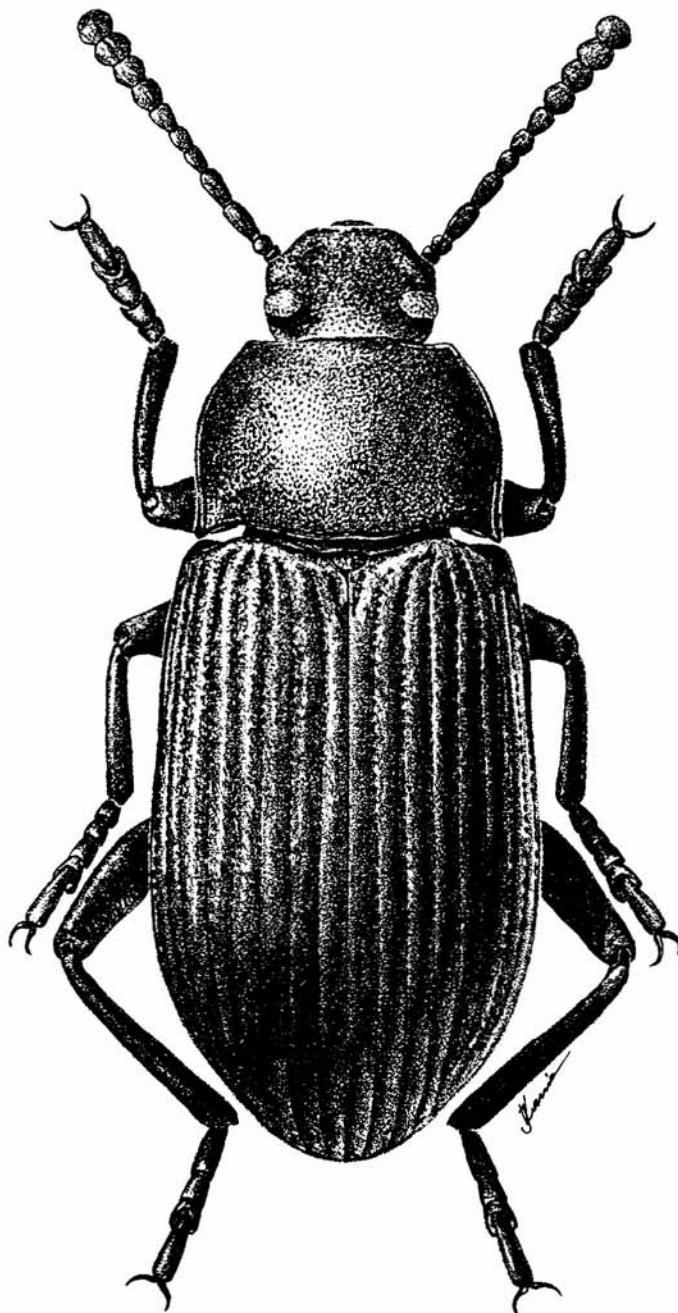
DIAGNOSIS

Strongly protruding eyes (5 facets in the narrowest place between the genae and tempora fig. 15) and the general habitus (el/pl above 3) place it close to *attenuatus*, *costulatus* and *mahaimi* in the *servus* group.

Like in *attenuatus*, male mid tibiae are provided with a ridge on the inner side, and with a small apical denticle (figs 46, 52). It differs from *attenuatus* in the absence of spine on the male mid femur and in the strongly punctured prosternum (fig. 41).

DESCRIPTION

Body length 9.1-13.3 mm. Body dark brown, shiny. Head and pronotum coarsely punctured, distance between punctures equals 1/2 puncture diameter. Mentum as in fig. 64. Pronotum: pl/pb = 0.57-0.67. Elytra: el/eb = 1.46-1.57, el/pl = 2.92-3.15, eb/pb = 1.19-1.33. Wings fully developed, ml/avl = 1.04-1.12, mc = 1.33-1.58. In row



99. *Zidalus burakowskii*, female (by J. KANIA)

IV 55-61 punctures. Male fore tibia slightly widened apically (figs 22-29), mid tibia with a small apical denticle (figs 46, 52), hind tibia arcuately bent (fig. 36). Shiny, bare gutters on the underside of tarsi as in *latipes*. Aedeagus as in *exalatus*.

MATERIAL EXAMINED

Burundi: Bujumbura R.P. GIRAUDIN, III.1974, Coll. P. ARDOIN 1978, (MNHN) 1 m;

Cameroon: Bamum, 6.1912, (NMW) 2 f; Cameroun, (TMB) 4 m, 4 f, (ZMK) 5 m, 1 f; Cameroun, Duila, RC, 18.7.1989, J. NIELSEN coll, (RGC) 1 m; Joko (TMB) 1 m, 2 f;

Central African Republic: Ubangi, Motenge-Boma, 22.XII.31, H. J. PRÉDO, (MRAC) 1 f;

Chad: H'Chari-Tchad, Fort-Sibut, Collection LE MOULT, Coll. J. CHATANAY 1914, (MNHN) 1 m.

Dahomey: Env.de Porto-Novo, WATERLOT 1911, (MNHN) 1 f;

Ethiopia: Abyssinie OCC. Oullaga Vallee Du Birbir, H. UNGEMACH 1927, (MNHN) 1 f;

Guinea: Guinee, ex. coll. J. THOMSON, (IRSNB) 1 f;

Kenya: Crater lake, Ouest Du L. Naivasha 1900 m, Mission de l'Omo, C. ARAMBOURG, P. A. CHAPPUIS & R. JEANNEL, 1932-33, (MNHN) 8 m, 8 f; Kitale 1800 m (en pairie), N. LELEUP, 2.XII.1953, (MRAC) 4 m, 2 f; Nairobi B.E.A., 1930 Coll. G. BABAULT, (MNHN) 6 m, 2 f; Naivasha, 7.37, Cenza Colony, A. TURNER, (TM) 1 m, 4 f; Yala River (pres Kisumu) B.E.A., G. BABAULT Sept. 1916, 1930 Coll. G. BABAULT, (MNHN) 8 m, 3 f;

Kongo: Congo Franç. Mayomba, A. VERGNES 1899, (MNHN) 1 f; Kafakumba, II.33, G. F. OVERLAET, (TM) 1 m;

Madagascar: Ambodiangezoka, XII.1938, J. VADON, (TM) 1 m; Andro, Sept. Imanombo Cap. Vacher 1901, dec. 1900 & janv., (MNHN) 1 f; Pays Mahafaly, BASTARD 1900, (MNHN) 5 f, 5 m; Madagascar Ouest, A. PEYRIERAS, Ankarafantsika, Ampijoroa III-IV-1973, (MNHN) 2 f;

Mozambique: Beira, P. LESNE 1928; Décembre, (MNHN) 9 m, 11 f; Beira, A. BODONG, Coll. P. ARDOIN 1978, (MNHN) 1 m, 1 f; BODONG, 1903, (TM) 1 m;

Nigeria: Mt. Ndoro, 15.III.1950, DE SAEGE 305, (MRAC) 2 m, 1 f;

Rhodesia: S. Rhodesia, 8.2.1928, Penkridge, HELSELLEX, (TM) 1 m;

Ruanda: Astrioa, X.1952, Dr. R. LAURENT, (MRAC) 2 m; Gitarama, 1850 m, terr. Nyanza, P. BASILEWSKY, I.1953, (MRAC) 1 f; Rukoma (Cheff.), terr. Nyanza, I.53, P. BASILEWSKY, (MRAC) 2 m, 1 f;

Senegal: Senegal (NHMB) 1 m, (ZMK) 1 f; Coll. R.I.Sc.N.B., Sénégal, ex coll. J. THOMSON; *Opatriinus servus* MULS., det. GEBIEN 1913, (IRSNB) 1 m; ex. coll. J. THOMSON, Senegal, (IRSNB) 1 f; Fleuve Blanc, D'ARNAUD 1843, (MNHN) 1 f;

Sierra Leone: Niala, 16.XI.26, (TM) 1 f;

Tanzania: D. O. Afrika (TMB) 1 f; Tanganyika, Mpala, VII/VIII.53, H. BOMANS, (MRAC) 4 m, 11 f;

Uganda: Ouganda Occidental, Province de Toro, Env. de Fort Portal, Ch. ALLUAUD 1909, Janvier, (MNHN) 1 m;

Zaire: Bagbele, 16.XII.49, D.S. 55, (MRAC) 1 m; Congo Belge, Elizabethville, (à la lumière), 1951/55, Ch. SEYDEL, H. BOMANS, Dr. KICHARD, (MRAC) 12 m, 10 f; Equateur, Bokama, II.1952, R. P. LOOTENS, (MRAC) 1 f; Garamba, 8.IV.51, J.V. 1545, (MRAC) 1 f; Jadotville, XI.1950, JJ. VAN MOL, (MRAC) 1 m; Kaimosi, A. TURNER, Mch., Apl.1932, (TM) 3 m, 4 f; Kasai: Luebo, 1943/44, DE HAUTMAUN, (TM) 1 f; Katanga, Nyonga, V.1925, G.F. DE WITTE, (MRAC) 22 m, 39 f; Kibali-Huri, Forêt de Djugu, (Lekwa), XII.1953, J. HECQ, (MRAC) 1 f; Kinchassa, WAEELBROECK, 25.5.1899, (TM) 1 f; Kivu: Costermansville, 1500/1800 m, IX.1949, H. BOMANS, (MRAC) 1 m, 2 f, Costermansville, 3.VII.37, H. J. BRÉDO, (MRAC) 4 m, 3 f; Ibande, 1952, M. VANDELANNOITE, (MRAC) 1 m, 4 f, (TM) 3 m, 3 f, Kadjudju, 1930, Coll. G. BABAUT, (MNHN) (5 f, 2 m), Katana, X.33, L. BURGEON, (MRAC) 1 f, Kavimvira (Uvira), à la lumi,re, G. MARLIER, (MRAC) 1 f, Kashusha, 37, VANDELANNOITE, (MRAC) 1 f, Kivu Tshaya, (MNHN) 1 f, Lac Kivu, Luzira, Guy BABAUT 1927, (MNHN) 4 m, 5 f, Mulungu, V.35, J. V. LEROY, (MRAC) 8 m, 11 f, Mulungu, 1938, HENDRICKX, [sur Caféier], (TM) 1 m, 2 f, Mulungu - Tshibinda, XI.1951, P.C. LEFÈVRE, (MRAC) 4 m, 9 f, T. Shabunda, Forêt Lubinbe, XI.38, Dr. HAUTMAUN, (TM) 1 f, Tshampu (rég. Ngweshe), 22.VI.1938, L. HENDRICKX, (MRAC) 1 f, Ouvira, Guy BABAUT 1927, (MNHN) 1 m; Uvira 1600 m, Lemera, XII.56, N. LELEUP, (MRAC) 3 m, Uvira, Kitu, 2000 m, N. LELEUP, XII.1955, (MRAC) 1 m, Uvira Mulenge, 1880-2010 m, (vest. for ombroph), V.1951, N. LELEUP, [recolté dans l'humus], (MRAC) 3 f, Uvira Rives L. Tanganiaka, 14.II.52, N. LELEUP, [récolté dans racines de roseaux], (MRAC) 1 m; Kisantu (TMB) 1 f, (ZMB) 1 m, 2 f, Kisantu, P. GILLET, (MRAC) 8 m, 8 f, Kungu, 1934 (Nkele), (coll. SCHOUTEDEN), (MRAC) 1 m; Léopoldville, XI/XII.1951, P. JOBELS, (MRAC) 1 f; Lulua: Kapanga, 1931/33, F. G. OVERLAET, (MRAC) 9 m, 7 f; Sandoa, 1930, G. F. OVERLAET, (MRAC) 2 m; Tshibamba, XII.31, G. F. OVERLAET, (TM) 1 f, (MRAC) 1 f; Mabwe, (lac Upemba) 585, 19-21.VIII.47, 707a, DE VITTE, (MRAC) 1 m; Mahagi - Niarembe, 1935, Ch. SCOPS, (MRAC) 4 f; Marais Ngombo (Walungu) 1600 m, VII.49, Dr. R. LAURENT, (MRAC) 2 f; Mawambi, (MRAC) 1 m; Mayidi, 1942, Rév. P. VAN EYEN, (TM) 4 m, 2 f; P.N.G., Miss. H. DE SAEGER, D.S, J.V., (MRAC) 65 m, 50 f; P.N.U. Miss. H. DE SAEGER, J. V., D. S., (MRAC) 36 m, 37 f; Rut Shuru, V.1937, J. GHESQUIÈRE, (TM) 1 m, 1 f; Thysville, 17.VII.49, N. LELEUP, Berges d'une mare [Recolté dans détritus de manioc], (MRAC) 45 m, 26 f;

Zambia: Rhodésie du Nort, Mweru - Wantipa Lac Chisi, XII.43, H. J. BRÉDO, (MRAC) 1 m; Tangan-Moero: Moba, 24.I.1933, L. BURGEON, (MRAC) 1 m.

TYPES

Opatriinus servus MULSANT and REY, 1853 - lectotype (male), MNHN, "Type MULSANT; Guinee, Bacardi; *Opatriinus servus* MULS., Guinee; Type; Museum Paris, Coll OBERTHUR ex coll Deyrolle" and paralectotypes (2 female), MNHN, "*O. servus*, ex coll. OBERTHUR, ex coll Deyrolle; *Dendarus exaratus*, *Opatriinus servus*, Museum Paris" i "*Opatriinus servus*; Senegal; Type; Museum Paris, coll L. FAIRMAIRE, 1906".

Opatriinus setuliger Cl. MUELLER, 1887 - lectotype (female), ZMAN, "BRADSHAW Zambesi 1878; 342; Geschenk v. ULSEN, 1881, Clement MULLER determ, *setuliger* Cl. M.; Cotype: *Opatriinus setuliger* Cl. MULL., 1887; Coll. Natura Artis Magistra" and paralectotypes (4 female), ZMAN, "BRADSHAW Zambesi 1878; Cotype: *Opatriinus ater* Cl. MULLER, 1887; *setuliger*, det. GRIDELLI, 1946; Coll. Natura Artis Magistra".

DISTRIBUTION

Burundi, Cameroon, Central African Republic, Chad, Dahomey, Ethiopia, Guinea, Kenya, Kongo, Madagascar, Mozambique, Nigeria, Rhodesia, Ruanda, Senegal, Sierra Leone, Tanzania, Uganda, Zaire, Zambia.

Zidalus mahaimi n. sp.

NAME DERIVATION

Named in honour of Nane and Charles MAHAIM, the best friends of my family.

Terra typica: Monrovia (Liberia).

DIAGNOSIS

The species belongs to the *servus* group (strongly protruding eyes, fig. 14).

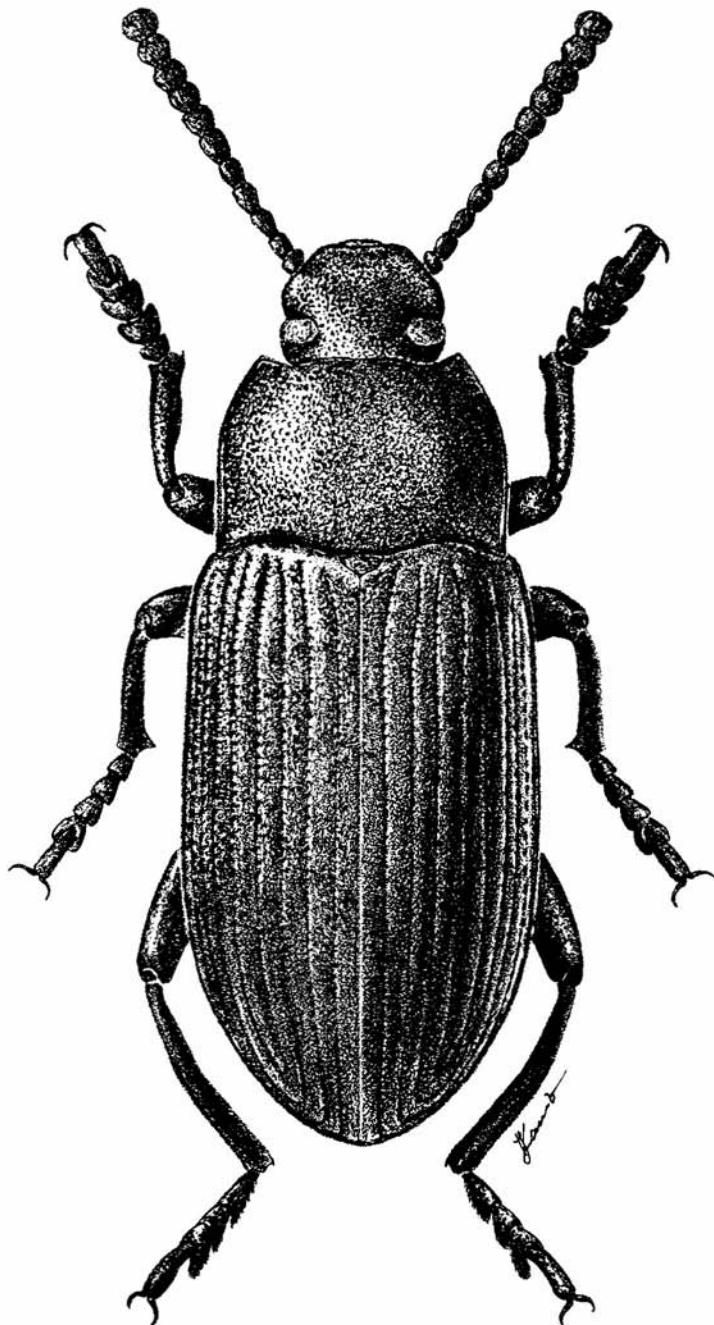
It resembles *costulatus* (see diagnose of *costulatus*) from which it differs in having an apical denticle on male mid tibia (before the apex in *costulatus*) and in sparse body vestiture.

DESCRIPTION

Body length 10.1-11.4 mm, body dark brown, strongly shiny (fig. 100). Mentum as in *servus*. Pronotum (fig. 18): pl/pb = 0.62-0.67, sides poorly rounded, posterior angles right. Elytra el/eb = 1.56-1.72, el/pl = 3.00-3.58, eb/pb = 1.19-1.37, row IV of 58-65 punctures. Wings fully developed, ml/avl = 1.00-1.10, mc = 1.25-1.54. Male fore tibia slightly broadened apically (figs 27, 34), mid tibia with a large apical denticle (figs 42, 48), hind tibia arcuately bent. Shiny, bare gutters on the underside of tarsi as in *latipes*. Aedeagus as in *exalatus*.

TYPES

Holotype, 1 male, MIZPAN, "Monrovia", [Liberia]. Paratypes: Cameroon: (ZMK) 2 m; Bois des Singes Douala, J. CANTALOUBE, Nov. 1958, Coll. P. ARDOIN 1978, (MNHN) 2 f; Kamerun, Barambi, CONRADT, (MIZPAN) 1 f; Mar Dougula b. Ira, Tschadgebiet, AEF, (TMB) 1 f; Mbalmayo, Cl. BESNARD., XII.1968, Coll. P. ARDOIN 1978, (MNHN) 1 m, 2 f; II.1973, Mbalmayo, N'BARGA leg., Coll. P. ARDOIN 1978, (MNHN) 1 m, 1 f; Montes, (MB) 1 m; Moucher Kribi Febr. 1972, Coll. P. ARDOIN 1978, (MNHN) 1 f; N'Kongsamba, J. CANTALOUBE, October 1956, Coll. P. ARDOIN 1978, (MNHN) 1 f; N'Kongsamba, June 57, (TMB) 6 m, 2 f;



100. *Zidalus mahaimi*, male (by J. KANIA)

Ghana: Ashanti, Kumasi, 330 m, N 6.43 - W. 1.36, light trap 20.11.1967, leg. ENDRÓDY-YOUNGA (TMB) 1 m, 1 f; Manso-Amenfi, 25.II.1968, Cl. BESNARD leg., Coll. P. ARDOIN 1978, (MNHN) 1 f; Takoradi, I/II.1968, Cl. BESNARD leg., Coll. P. ARDOIN 1978, (MNHN) 1 m, 4 f;

Guinea: Guinée, Nimba, M. LAMOTTE II.IV.42; Yalanzou, (MNHN) 1 f; Guinée Française, N'Zébéla, P. CHABANAUD 1920, Février, (MNHN) 1 m; Guinée Française, N'Zérékoré, P. CHABANAUD 1920, Février, (MNHN) 1 f;

Ivory Coast: Côte D'Ivoire, Zida, ex. coll. R. OBERTHUR, LEPESME 1946, (MNHN) 2 m;

Nigeria: Ile-Ife W. State May 1973 J. T. MEDLER Coll., Coll. P. ARDOIN 1978, (MNHN) 1 m;

Senegal: Sénégal, Saint-Louis Delestre 1896, (MNHN) 1 m; Senegal, (ZMK) 1 f.

Upper Volta: Haute Volta, Banfora, 13.X.1976, P. JOLIVET leg., Coll. P. ARDOIN 1978, (MNHN) 1 m; 1-10.VII.1971, Pabré, R.P. FERNANDEZ, Coll. P. ARDOIN 1978, (MNHN) 2 f.

DISTRIBUTION

Cameroon, Ghana, Guinea, Ivory Coast, Liberia, Nigeria, Senegal, Upper Volta.

REMARKS

The species was hitherto erroneously interpreted as *Opatriinus servus* described in 1853 by MULSANT and REY from Guinea. *Opatriinus setuliger* described by MULLER (1887), based solely on females, is a synonym of *O. servus*. In 1948 GRIDELLI wrote that M&R, when describing *O. servus*, probably had seen only a female and because of this listed no dimorphic characters in the leg structure. Based on this (and not seeing type specimens) he gave an interpretation, erroneous in my opinion, of *O. servus* and *O. setuliger* (accepted later in KOCH's 1956 paper). The real *O. servus* is listed in his paper as *O. setuliger*, while *O. servus* in GRIDELLI's paper is actually a new species which I name *Zidalus mahaimi*. My interpretation agrees with GEBIEN's identification of *O. servus* from Senegal (see material examined).

Zidalus attenuatus (KLUG, 1833) comb. nov.

Opatrium attenuatum KLUG, 1833: 88.

Opatriinus attenuatus KLUG: GEBIEN 1922: 273; 1938: 296; GRIDELLI 1947: 44; KOCH 1956: 114.

Opatriinus madagascariensis MULSANT et REY, 1853a: 319; 1853b: 94; GEMMINGER and HAROLD 1870: 1915; FAIRMAIRE 1887: 283; MULLER 1887: 302; GEBIEN 1910: 277; CHATANAY 1913: 766; syn. by GEBIEN 1922: 273.

Eurynotus inops FAHRAEUS, 1870: 289; GEBIEN 1938: 295; KOCH 1953: 272.

Opatriinus attenuatus bottegoi GRIDELLI, 1947: 45; KOCH 1956: 115.

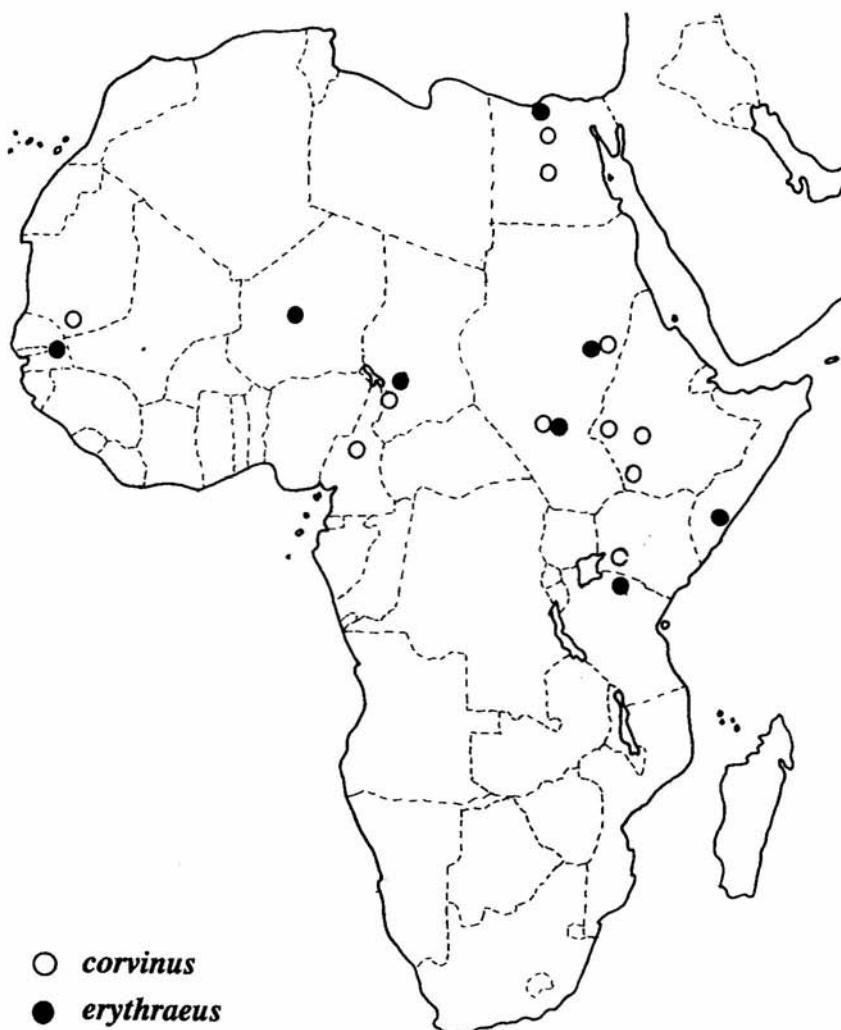
Terra typica: Madagascar.

DIAGNOSIS

The species is a member of the *servus* group (see diagnose of *servus*).

DESCRIPTION

Body length 8.2-11.9 mm, $pl/pb = 0.59-0.67$, $el/eb = 1.44-1.59$, $el/pl = 2.83-3.08$, $eb/pb = 1.22-1.29$, $ml/avl = 0.92-0.96$, $mc = 1.10-1.42$. Shiny, bare gutters on the underside of tarsi as in *latipes*.



101. Distribution of *Zidalus corvinus* and *Z. erythraeus*

MATERIAL EXAMINED

Botswana: Maun Dist., Central Africa, (TM) 1 m;

Ethiopia: Ethiopie Sidamo, Coll. P. ARDOIN 1978; 24-X-1961, Lac Abaya, (MNHN) 1 f; Ethiopie Merid, Nanoropus, Mission de l'Omo, C. ARAMBOURG, P.A. CHAPPUIS & JEANNEL 1932-33; Bords Du Rodolphe, 565 m., (MNHN), 34 m;

Comoren Archipelago: Gr. Comoro, Kiiste 3. VIII. 1903, (ZMB) 1 m, 3 f; Moheli, X.43 (ZMB) 21 m, 15 f; Mohéli, Kangani, JM. VI, (TM) 6 m, 3 f; Mayotte, HAMOUTZON A.F., II.56, (TM) 1 f;

Kenya: lac Jipe, Teita Distr., Mission Zoolog. I.R.S.A.C., en Afrique orientale, (P. BASILEWSKY et N. LELEUP), rive Nord-Est 1000 m, 19.VII.57, (MRAC) 2 f; Kalin N. Turkhana, September, 1941, T. H. E. JACKSON, (MRAC) 1 f; Mt. Elgon, Umgebung, Mt. Elgon Lodge, 2100 m, 1.-2.4.1988, R. GRIMM, (RGC) 1 m;

Madagascar: (NHMB) 1 m; Coll. R.I.Sc.N.B., ex. coll. J. THOMSON, (IRSNB) 1 f; Ambanja, III.51, RP., (MRAC) 1 m; Ambanja, Antremabé, R.N.IV Madagascar P. SOGA rec., II.1964, Coll. P. ARDOIN 1978, (MNHN) 1 f; Ambilobe, IV.51, R.P. (TM) 1 f; Ampijoroa Isaramandroso, Institut Scientifique Mad., Coll. P. ARDOIN 1978, (MNHN) 2 f; Andrangoloaka, Ost-Imerina, (TM) 1 m; Béalanana, Autanamazera, L.M., (TM) 2 m, 1 f; Boeni Maevatanana, Dr. J. DECORSE 1901., 17 Janv. 1900, (MNHN) 1 f; I.S., 12.9.47, (TM) 1 f; Maevatanana, Coll. LE MOULT Naturaliste, Paris, Coll. V, Coll. J. CHATANAY 1914, (MNHN) 3 m, 5 f; Mahilaka, det. Ambanja, VIII-59 R.E, (MNHN) 1 f; Maroantsetra, Vaolux, (TM) 1 m; 1 f; Nossibe, Coll. KRAATZ, (DEI) 1 f; Nossibe, A. VOELTZKOW S., VI.95 - (ZMB) 2 m, 3 f; Nossi-Bé, (Pierron) Coll. A. BONHOURE 1909, (MNHN) 3 f; Nossi-Bé, Coll. J. CHATANAY 1914, (MNHN) 1 f; Nossi-Bé, 1935, coll. M. SÉDILLOT, (MNHN) 2 m, 3 f; Plantations u Sambirano, Coolection LE MOULT, coll. J. CHATANAY 1914, (MNHN) 1 m;

Mozambique: Beira, BODONG 1904, (TM) 1 m, 13 f; Beira A., BODONG, Coll. C. & O. VOGT Acq 1960, (ZMAN) 2 m, 3 f; Bikatla, H.A. JUNOD, (MNHN) 3 m; Meponda, Porto Nyasa, VIII.1955, (TM) 27 m, 10 f; Moçambique, Prov. de Gorongoza, Tendos de L'uréma, G. VASSE 1907; Février, (MNHN) 1 m, 2 f;

Republic of South Africa: Caffraria, (TM) 1 m; Natal, D' Urban, (TM) 1 m; Port Natal, POPP, (ZMB) 1 m; Zoutpansberg, Nov. 1924, H. J. HESKE, (TM) 1 f;

Rhodesia: A. BODONG, Umtali, Coll. KRAATZ, (DEI) 1 f;

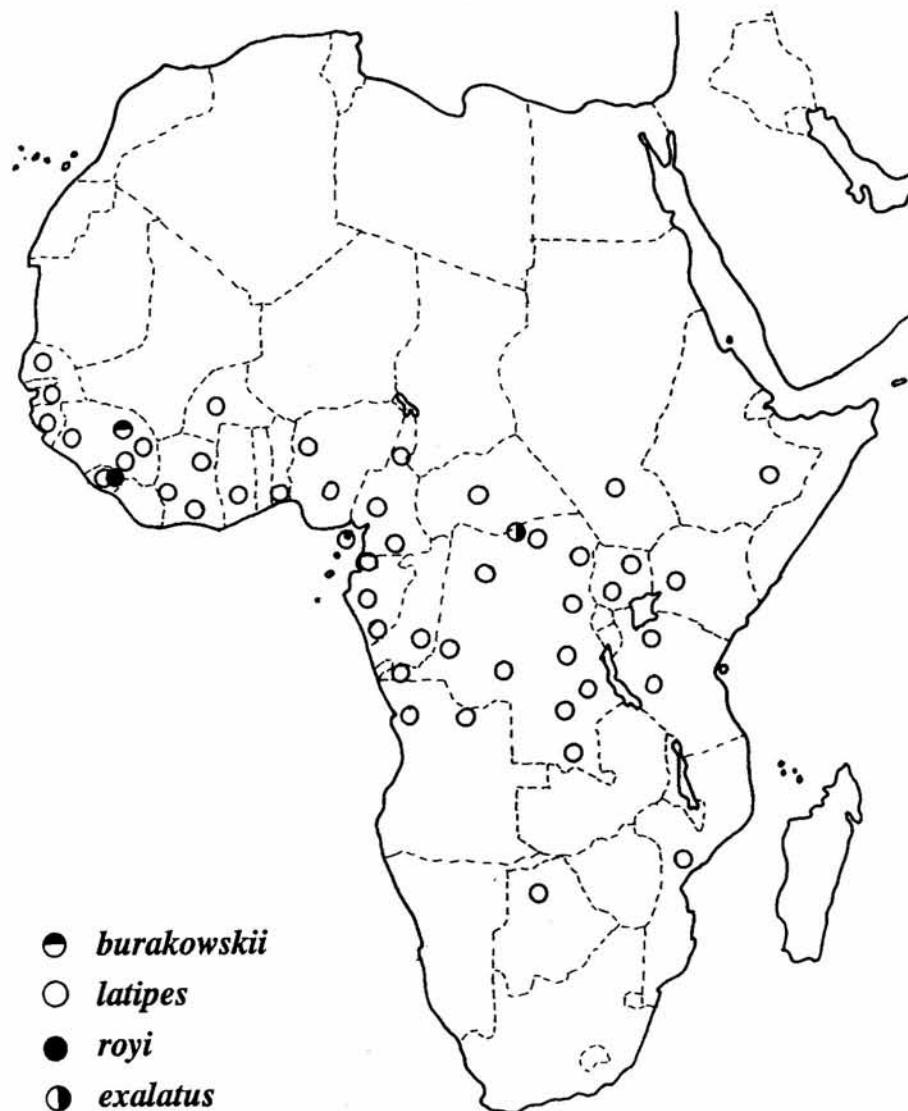
Sudan: N.O. Afrika, N. Galla V. ERLANGER S.b., 8.I.01 Gümeire Pagan Geb., (ZMB) 4 f, 3 m; Ontar - Adjuba, O. NEUMANN, (ZMB) 1 m;

Tanzania: Dar es - Salam (STAUDINGER), Coll. C. & O. VOGT Acq 1960, (ZMAN) 1 m; Delagoa - Bay STAUDINGER Afr., Coll. C. & O. VOGT Acq. 1960, (ZMAN) 2 f, 1 m; D.O. Afrika, 25.IV.91, w Ukami, STUHLMANN S. (ZMB) 1 f; Kondoa, BLAYET 1885, (MNHN) 1 f; Nyassa-See, Neu Helgoland XII.99, FÜLLEBORN S., (ZMB) 4 m, 3 f; Zanzibar, HAFFRAY, (MNHN) 1 f;

Zaire: Congo Belge, P.A.G., 10.X.51, DS, (TM) 1 m; Kambove, W. 150-200 miles, 3,5-4,5 tys. ft., (TM) 1 f; Kasenyi, 1935, H. J. BREDO, (MRAC) 2 f; Monga, BAROTSELD, 1952, (TM) 1 f.

TYPES

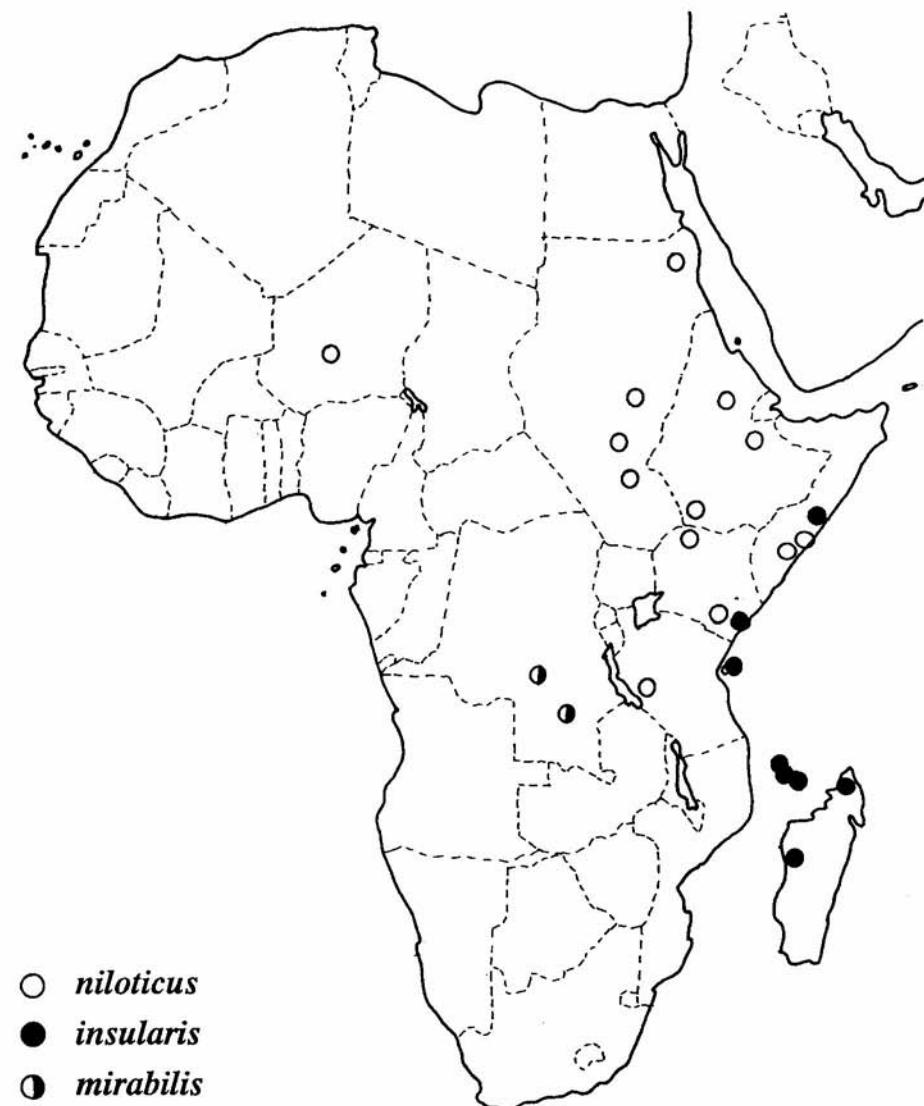
Opatrium attenuatum KLUG, 1833 - lectotype (male), ZMB, "Opatr. attenuatum KLUG, Madagascar, GOUDOT, 45773", paralectotypes (male, female), ZMB (present designation).



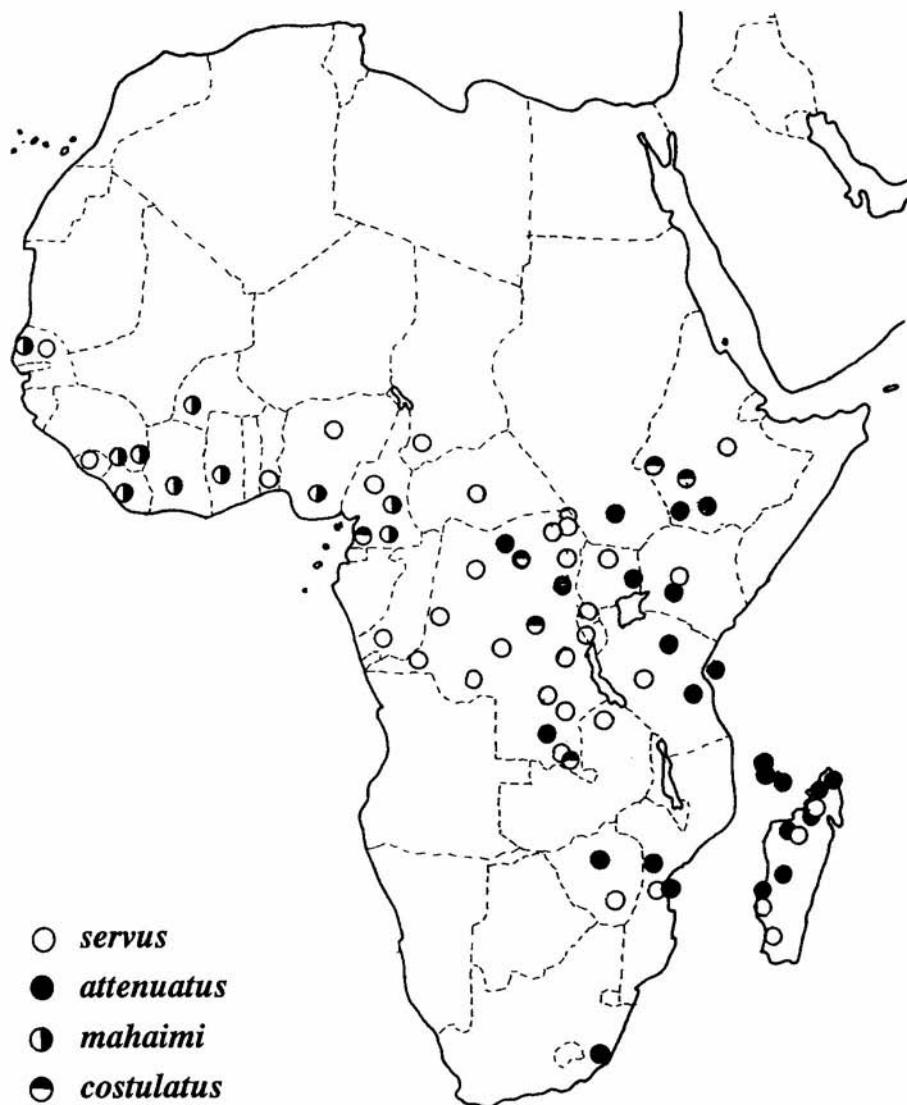
102. Distribution of *Zidalus burakowskii*, *Z. latipes*, *Z. royi* and *Z. exalatus*

DISTRIBUTION

Botswana, Ethiopia, Comoren Archipelago, Kenya, Madagascar, Mozambique, Republic of South Africa, Rhodesia, Somalia*, Sudan, Tanzania, Zaire.



103. Distribution of *Zidalus niloticus*, *Z. insularis* and *Z. mirabilis*

104. Distribution of *Zidalus servus*, *Z. attenuatus*, *Z. mahaimi* and *Z. costulatus*

REFERENCES

ARDOIN, P., 1963. La réserve naturelle intégrale du Mont Nimba. III. *Coleoptera Tenebrionidae*. Mémoires de l'Institut Français d'Afrique Noire, **66**: 221-267.

ARDOIN, P., 1965a. Contribution à la faune du Congo (Brazzaville) (Mission A. VILLERS et A. DESCARPENTRIES). VIII. Coléoptères Ténébrionides. Bulletin de l'Institut Français d'Afrique Noire, ser. A, **27**(3): 963-1015.

ARDOIN, P., 1965b. Note préliminaire sur les Ténébrionides récoltés aux monts Loma (Sierra Leone). Bulletin de l'Institut Français d'Afrique Noire, ser. A, **27**(4): 1315-1320.

ARDOIN, P., 1969a. Note synonymique [Col. *Tenebrionidae*]. Bulletin de la Société entomologique de France, **74**: 124-127.

ARDOIN, P., 1969b. Contribution à la connaissance de la Faune Entomologique de la Côte-D'Ivoire (J. DECELLE, 1961-1964). 37-*Coleoptera, Tenebrionidae*. Annales du Musée Royal de l'Afrique Centrale, Sciences Zoologiques, **175**(8): 139-285.

ARDOIN, P., 1971. Le massif des Monts Loma (Sierra Leone). XII. *Coleoptera Tenebrionidae*. Mémoires de l'Institut Fondamental d'Afrique Noire, **86**(1): 283-290.

ARDOIN, P., 1972a. Coléoptères Ténébrionidae récoltés par M. Claude Girard à la Station d'Écologie Tropicale de Lamto (Côte d'Ivoire). Bulletin de l'Institut Français d'Afrique Noire, ser. A, **34**(4): 880-912.

ARDOIN, P., 1972b. Liste des espèces de *Tenebrionidae* (*Coleoptera*) récoltées au Sudan par les expéditions finlandaises (1962-1964). *Commentationes Biologicae*, **49**: 1-20.

BAUDI, F., 1876. *Europae et circummediterraneae Faune Tenebrionidum specierum Pars altera*. Deutsche Entomologische Zeitschrift, **20**(1): 225-267.

CHATANAY, J., 1913. Contribution à la Faune des Coléoptères des Iles Comores, 2 Note. *Tenebrionidae*. Annales de la Société Entomologique de France, **82**: 765-777.

DEJEAN, M., 1836. Catalogue des coléoptères de la collection de M. Le Comte DEJEAN. Troisième Edition, revue, corrigée et augmentée. Hétéromères. Paris, **3**, (1837) pp. 196-236.

ESPAÑOL, F., 1943. Misión científica E. MORALES AGACINO, CH. RUNGS y B. ZOLOTAREVSKY a Ifni y Sahara español. *Tenebrionidae* (*Coleoptera*). 1 Parte. Eos, **19**: 119-148.

ESPAÑOL, E., LINDBERG, H., 1963. Coleópteros tenebriónidos de las Islas de Cabo Verde. *Commentationes Biologicae*, **25**(3): 1-51.

FAHRAEUS, O.J., 1870. *Coleoptera Caffrariae*, annis 1838-45 a J. A. WAHLBERG collecta. *Heteromera*. Öfversigt af Kongl. Vetenskaps-Akademiens Förfärlingar, Arg. 27, No. 4, pp. 243-358, Stockholm.

FAIRMAIRE, L., 1887. Coléoptères des Voyages de M. G. REVOIL chez les Somalis et dans l'intérieur du Zanguebar. Annales de la Société entomologique de France, **7**(6): 283.

FAIRMAIRE, L., 1888. Descriptions de Coléoptères de l'Indo-Chine. Annales de la Société entomologique de France, **8**(6): 332-378.

FAIRMAIRE, L., 1891. Descriptions de Coléoptères des montagnes de Kashmir. Bulletin de la Société entomologique de Belgique, **35**(16): 88-103.

GEBIEN, H., 1904. Beiträge zur Kenntnis der Insektenfauna von Kamerun. No 28. Verzeichnis der von Professor Dr. Yngve SJÖSTEDT in Kamerun gesammelten Tenebrioniden. Arkiv för Zoologi, utgivet af Kongl. Vetenskaps Akademien, **2**(5): 1-31.

GEBIEN, H., 1906. Über die von Fabricius beschreiben Typen von Tenebrioniden in den Museen von Kopenhagen und Kiel. Deutsche Entomologische Zeitschrift, **1**: 209-237.

GEBIEN, H., 1907. Tenebrioniden aus dem Spanischen Guinea. Memorias de la Real Sociedad Española de Historia Natural, **1**(22): 403-420.

GEBIEN, H., 1910. *Tenebrionidae* I, in W. JUNK et S. SCHENKLING: Coleopterorum Catalogus, Pars 18(22): 167-354[276-277], Berlin.

GEBIEN, H., 1921. Die Tenebrioniden West-Afrikas. Archiv für Naturgeschichte, (1920), **86**(6): 1-256.

GEBIEN, H., 1922. *Coleoptera, Heteromera: Tenebrionidae*. Percy Sladen Trust Expedition to the Indian Ocean in 1905. The Transactions of the Linnean Society of London, **18**(1): 261-324.

GEBIEN, H., 1928. Über einige Gruppen amerikanischer Tenebrioniden (Col. Heter.). Stettiner Entomologische Zeitung, **89**(1): 97-164.

GEBIEN, H., 1938a. Die Tenebrioniden der Namibwüste in Südwestafrica. Abhandlungen herausgegeben vom Naturwissenschaftlichen Verein zu Bremen, **30**: 20-107.

GEBIEN, H., 1938b. Katalog der Tenebrioniden. Teil II. Mitteilungen der Munchener Entomologischen Gesellschaft, **28**: 49-80, 283-428 [370-465].

GEISTHARDT, M., 1984. Zur Kenntnis der Käfer der Kapverden. Ergebnisse der Sammelreise 1982 (*Insecta: Coleoptera*). Courier Forschungs-Institut Senckenberg, **68**: 57-94.

GEMMINGER, [M.], HAROLD, [E.], 1870. Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus. 7, *Tenebrionidae: Diastolinus ... Hopatrinus*. Monachii, pp. 1913-1915.

GIRARD, C., 1975. Étude des peuplements de Coléoptères Ténébrionides de la savane de Lamto (Côte D'Ivoire). Annales de la Société entomologique de France (N.S.), **2**: 335-381.

GRIDELLI, E., 1940. Coleotteri dell'Africa orientale Italiana. (XI contributo). Memorie della Società Entomologica Italiana, Genova, (1939), **18**: 219-258.

GRIDELLI, E., 1947. Coleotteri dell'Africa Orientale. (XV contributo). Specie Africane del genere *Opatriinus* MULS. REY (Coleopt. *Tenebr.*). Atti Museo Civico Storia Naturale Trieste, **16**(3): 37-52.

GRIDELLI, E., 1950. Contribution à l'étude de l'Afr. 10. Coléoptères *Tenebrionidae*. Mémoires de l'Institut Français d'Afrique Noire, **10**: 153-180.

GRIDELLI, E., 1954. La réserve naturelle intégrale du mont Nimba. Coléoptères Ténébrionides. Mémoires de l'Institut Français d'Afrique Noire, **40**: 123-146.

GRIMM, R., 1986. Tenebrionidae aus Niger und Mali (Coleoptera, Tenebrionidae). Mitteilungen der Münchner Entomologischen Gesellschaft, **76**: 71-78.

GUÉRIN-MÉNEVILL, E. F. E., 1849. in: LEFEBVRE, Voyage en Abyssinie exécuté pendant les années 1839-1843, Insects, VI, pp. 239-390.

KASZAB, Z., 1963. Angaben zur Kenntnis der Tenebrioniden des Tschadsee-Gebietes, nebst einer Revision der afrikanischen *Mesomorphus*-Arten (Coleoptera). Revue de Zoologie et de Botanique afr., **67**(3-4): 341-387.

KLUQ, Fr., 1833. Bericht über eine auf Madagascar veranstaltete Sammlung von Insecten aus der Ordnung Coleoptera. Abhandlung der Königlichen Akademie der Wissenschaften, **1832-1833**, pp. 88-97.

KOCH, C., 1935. Wissenschaftliche Ergebnisse der Entomologischen Expedition seiner durchlaucht des fuersten A. DELLA TORRE Tasso nach Aegypten und auf die halbinsel Sinai. Bulletin de la Société Royale Entomologique d'Egypte, **19**: 1-111.

KOCH, C., 1953. The tenebrionidae of southern Africa. XXVI. - New Port. East african species collected by Dr. A. J. Barbosa. Revista da Faculdade de Ciencias, 2 série, C, 3, pp. 239-310, 24 ff., 1 pl.

KOCH, C., 1955. The tenebrionidae of southern Africa. XXV. New, forgotten or palearctic genera and species of *Opatriinae*. Annals of the Transvaal Museum, **22**, pp. 419-476, 64 ff., 3 pls.

KOCH, C., 1956. Exploration du Parc National de l'Upemba. II. *Tenebrionidae* (Coleoptera, Polyphaga), *Opatriinae*, First part: *Platynotini*, *Litoborini* and *Loensini*. Bruxelles, **40**, 472 pp., 282 ff., 335 pls.

KULZER, H., 1960. Einige neue Tenebrioniden (Coleoptera). 20. Beitrag zur Kenntnis der Tenebrioniden. Entomologischen Arbeiten aus dem Museum G. Frey, **11**: 317.

KULZER, H., 1963. Verzeichnis des Typenmaterials der Tenebrionidensammlung des Museums G. Frey. Entomologischen Arbeiten aus dem Museum G. Frey, **14**: 375-434.

LINDBERG, H., 1962. Coleoptera Insularum Canariensium. III. *Tenebrionidae*. Commentationes Biologicae, **25**(1): 1-86.

MULSANT, E., REY, Cl., 1853a. Essai d'une division des derniers Mélasomes. Pedinites. Opatrinaires. Mémoires de l'Académie des Sciences, belles-lettres et Arts de Lyon, **2**: 294-332.

MULSANT, E., REY, Cl. 1853b. Essai d'une division des derniers Mélasomes. Pedinites. Opatrinaires. Opuscules Entomologiques, **4**: 69-107.

MÜLLER, Cl., 1887. Vierzehn neue Heteromeren, von BRADSHAW im Zambesi-Gebiet aufgefunden. Tijdschrift voor Entomologie, **30**: 297-309.

QUEDENFELDT, G., 1885. Verzeichniss der von Maj. v. MECHOW in Angola etc. ges. Tenebrioniden und Cisteliden. Berliner Entomologische Zeitschrift, **29**: 8.

REITTER, E., 1904. *Tenebrionidae* (III. Theil) mit den Abtheilungen: *Lachnogyini*, *Akidini*, *Pedinini*, *Opatriini* und *Trachyscelini* in Bestimmungs-Tabelle der europäischen Coleopteren. Verhandlungen des naturforschenden Vereines in Brünn, **53**: 25-189.

SAHLBERG, C. R., 1823. *Periculum entomographicum, Species Insectorum nondum descriptas proponens, Aboae, 1: 1-82.*

WOLLASTON, T. V., 1864. Catalogue of the coleopterous insects of the Canaries in the collection of the British Museum, pp. 1-648, London.